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ABSTRACT

A collection of papers is presented which focuses primarily on presently available technology of multi-channel one-way cable television which presents major new opportunities for education and to a lesser extent on the more advanced two-way cable which will assume increasing importance in educational applications in the years ahead. The 30 articles are divided into six parts: (1) the present status of cable communication in relation to higher education; (2) the market for cable-based higher education; (3) software for higher education programing; (4) the university and the municipal cable system; (5) institutional organization and administration; and (6) the university and the knowledge industry. (WCM)

ED 093378

# CABLE TELEVISION and the UNIVERSITY

R 000 885

Proceedings of the
Conference
Dallas, Texas
January 1974

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**CABLE TELEVISION** *and the* ***UNIVERSITY***

# Proceedings of the Conference

**January 29-31, 1974**

**EDUCOM, Educational Testing Service**
**Cable Television Information Center of the Urban Institute**

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# FOREWORD

There is a growing interest in cable television in communities across the country. Nearly 3,000 communities have applications for operation of cable systems pending and 2,800 others have already been wired. In 1974, it is important for colleges and universities to be aware of the opportunities and challenges presented by this technology. Institutions of higher education which are now faced or soon will be faced with decisions about cable may benefit from the experience and policies of others who have used cable or who have recently entered into agreements with cable operators.

EDUCOM, The Cable Television Information Center of the Urban Institute and the Educational Testing Service conceived the conference, *Cable Television and the University*, as a forum to bring together administrators faculty policy makers and other educators from a wide range of institutions of higher education to discuss ways in which colleges and universities can act, together with their communities or independently, to take advantage of this emerging technology. Nearly 400 individuals participated in the invitational conference, January 29-31, 1974 at the North Park Inn in Dallas, Texas. Support for the conference was provided by the John and Mary R. Markle Foundation and the National Science Foundation. In panel broken and small group

workshops, conferees addressed issues related to the use of cable television by colleges and universities and questioned those with experience in particular areas of cable television use.

The presentations given at the conference and a summary of ideas raised in the general discussion sessions are brought together in this volume with the hope that these materials will be useful to faculty and administrators at colleges and universities who were unable to attend the meeting. Papers focus primarily on presently available technology of multi-channel one-way cable television which presents major new opportunities for education and to a lesser extent on the more advanced two-way cable which will assume increasing importance in educational applications in the years ahead.

Interest in a wide range of follow-up activities was expressed at the conference by many participants. As the sponsoring organizations undertake to begin some of the follow-up activities suggested by conferees, we would appreciate suggestions and expressions of interest from readers who were not able to participate in the conference but who do wish to participate in continuing activities related to cable television and the university.

Henry Chauncey
EDUCOM

W. Bowman Cutter
CTIC of the Urban Institute

William W. Turnbull
ETS

# CHAPTER 1

# Cable Television and the University: A Conference Overview

**by Kas Kalba**

Cable television, it has been said, is a technology with many futures, one past, and no present. The statement has some merit. Cable's present is very much a no-mans land where the technology's modest rural beginnings confront its broadband urban expectations. It is a place of diverse social visions and economic forces, of occasional stalemate and frequent uncertainty.

It was around the search for cable's present in higher education that the conference on Cable Television and the University was organized. The issues underlying this search are not difficult to pinpoint. They include broad-ranging questions about the opportunities that cable television may provide in the meeting of educational objectives as well as specific considerations with respect to budgetary allocations, facilities, equipment, and faculty objectives. And it is hardly incidental that issues at these two levels of concern need to be closely interrelated. For the broad opportunities, if they exist, will not be realized without concrete, short-term commitments. Nor will incremental administrative decisions remain meaningful in the absence of extended educational impact.

Education's experience with technology has not, after all, been free of mishaps. The tendency to place too much emphasis on technology, particularly on its "hardware" aspects, has been as pronounced in

education as elsewhere in society. Fortunately, we are beginning to learn that the hasty introduction of technology into the educational process can be an empty panacea, particularly when the institutional, budgetary, and programming support necessary for the effective utilization of technology is not assured. In other instances, education has been slow in taking advantage of certain communications developments. Commercial television was 20 years old before *Sesame Street* emerged. And similarly, the educational utilization of computers and electronic facsimile machines lags behind their effective use in the business sphere.

## TWO IMPORTANT TRENDS

A major purpose of the conference, therefore, was to assess cable television in a manner that was neither oblivious to its potential nor prematurely committed to its adoption. In addition, given its prognostic orientation, the conference needed to be aware of the non-technological trends that are likely to affect the development of higher education over the next decade. Among these, two in particular emerged as particularly important. The first can be stated as the growing need to expand access to higher education and to integrate learning more fully with life-time activities, whether through career, adult, extension, or continuing education programs. The other is the need to limit capital requirements and/or increase productivity in educational delivery, given the changing financial relationships that higher education is already beginning to experience.

These two pressures are not necessarily complementary. In fact, they place conflicting demands on college and university decision-makers to launch new programs or expand existing ones, on the one hand, and to tighten budget and investments on the other. Yet, as discussions at several of the conference panels pointed out, the combined prospect of a new distribution medium to the home and of the potential availability of a wide array of educational programming may offer a way toward meeting these twin pressures. By taking advantage of its commercial development, colleges and universities may find cable television a much less costly and more convenient mode for serving new educational needs than through physical campus expansion. And by storing educational materials on film or videotape for widespread distribution, both curricular variety and economies of scale may be achieved.

## SOME LIMITATIONS AND MODIFICATIONS

While the conference provided a forum for examining this vision of institutional extension, it by no means endorsed it without qualification. In fact, it was on one or another limitation or modification of this vision

that many of the conference presentations and discussions centered. For example, it quickly became clear that the availability of a new home-distribution system is only one element in the development of a full-fledged extension program. Various types of communicaitons-based extension programs are already in existence, utilizing public television, ITFS (Instructional Television Fixed Service), microwave, or videocassette distribution modes. And while insufficient channel capacity may be one of the constraining factors on the broader development of such programs, it is only one among many. Institutional commitment to extension education (including adult and continuing education); the difficulties of market definition; inadequate testing of tutorial and accreditation mechanisms; the lack of faculty incentives for programming development; and financing limitations are equally debilitating barriers to the realization of extension objectives.

Similarly, a number of issues were raised concerning the programming that would be transmitted by cable television or other new distribution technologies to homes, employment sites, and learning centers. While the effectiveness of televised instruction in basic courses was generally accepted, it was less clear how seminars and less structured forms of campus interaction could be replicated, even over a two-way medium. At a minimum, the need for tutorial sessions or other interactive contact between the off-campus students and the educational provider was called for. And there was considerable division over the kind of programming production that cable-based education would entail. Some argued that only elaborate, high-quality productions could compete with entertainment programming and/or satisfy broad-based accreditation criteria. Others, pointing to the local distribution nature of cable technology and the emergence of low-cost video production equipment, insisted that students would be better served with a greater variety of educational videotapes produced in a more ad hoc manner (the "quick and dirty" approach, as this came to be labeled).

Moreover, many conference participants were convinced that only some of these institutional and programming issues could be resolved at the level of the individual college or university. The resolution of others, they contended, would depend on the joining together of groups of institutions into production or accreditation consortia. Still others would require the test of demonstration projects or the creation of new institutions, funded by foundations or federal and state agencies. Joint efforts with the private sector, including educational materials distributors, videopublishers, and equipment manufacturers were also explored. Finally, the role of the cable television industry itself (including its investors and regulators) in facilitating cable-based educational programming was taken into account. Without sustained growth, technical development, and programming support on the part of the industry, the educational

opportunity of cable television may not materialize on a broad basis.

In short, the probing of issues went both inward and outward. Yet ultimately it had to return to the particular concerns of the 400 college and university administrators and faculty members who were present at the conference. These were discussed at the two workship sessions that were held during the conference. They were also expressed in a very clear-cut fashion by the six practical decision criteria that Lloyd Morrisett of the Markle Foundation outlined at the end of the conference in response to his rhetorical question of whether a college or university administrator should, in fact, become involved with cable television. As Morrisett indicated, a positive response to this question should depend on local cable penetration, the institution's existing television resources, its commitment to non-traditional study, and several other critical factors.

This practical perspective was also emphasized by William Turnbull of Educational Testing Service, who shared conference summarizing responsibilities with Morrissett. His emphasis, however, was on follow-up steps to the conference, the implementation of which could facilitate involvement in cable-based education programs by individual colleges and universities. The possible steps he listed, most of which were raised in the workshop sessions, ranged from the preparation of a handbook on video copyright and exchange issues to the establishment of a multi-purpose center for R&D and dissemination. It should be added that these follow-up suggestions have been incorporated into a questionnaire that EDUCOM has distributed to participating institutions. Responses to the questionnaire will indicate which follow-up options need to be pursued most actively.

## THREE MAJOR PURPOSES OF THE CONFERENCE

To sum up, the conference on "Cable Television and the University" served three major purposes in addition to its informational role and the many informal contacts it fostered. First, the conference provided a forum for a collective assessment of cable's potential utility in higher education. The technical, economic, and regulatory limitations of cable were evaluated as well as its possible educational uses. Secondly, it facilitated a close examination of the institutional and programming barriers to cable utilization. And third, it offered a set of development roles as well as specific follow-up actions, including educational and demonstration efforts, that could help to overcome some of these barriers. The developmental roles suggested were primarily aimed at the colleges and universities that were the main participants at the conference, but not exclusively so. Steps that could be undertaken by the cable industry, foundations, media publishers, government agencies, regulators, libraries, and other educational resource institutions were also discussed.

It is on this point of multiple developmental roles that it is perhaps

most appropriate to conclude this conference overview. In the long run, it is not yet clear whether cable-based higher education will be primarily guided by existing institutions of higher education, by new institutions and consortia, or by private market mechanisms. But in the shorter term, at least, some mix of these approaches is likely to emerge. This prospect increases the complexity of the endeavor at hand and the uncertainty with which educational decision-makers will have to contend. It increases the number of developmental roles that need to be undertaken. And it reminds us once again that institutions, not wires or cassettes, are our ultimate technology.

Cable Television and the University

# PART I

# CHAPTER 2

# Cable Television: The Adolescent Medium

**by W. Bowman Cutter**

In considering the topic of cable television and the university, it is wise to bear in mind that we are discussing an infant technology and an industry with a long history. Indeed, unkind observers of cable television's present economic difficulties have defined it as an infant industry with a brilliant future behind it. For the fact is that cable television has gone, and is going, through an evolutionary process with no end yet in sight. . . and is playing an increasingly central role in the upheavals that characterize communications policy today.

Cable television began and prospered as a medium for small towns in mountain valleys. It grew, at the start, in states like Pennsylvania where many towns could not receive the broadcast television signals that in the late 1940s and early 1950s were creating an entertainment and journalistic revolution. Cable television's ability to capture and distribute these signals was, therefore, in great demand. In the jargon, cable television served a "re-transmission" function but little else.

During the late 1950s and early 1960s, entrepreneurs began to attempt to bring the cable television business into larger and less isolated communities. In these locations, where some broadcast television was already available, cable businessmen attempted, naturally enough, to

augment the services they provided: These additional services took the form of distant broadcast signals, network or independent stations, that were not available to the towns except by cable television. Less frequently, cable operators provided certain services of their own such as news, or weather, or stock market reports, occasionally even live programming. However, by and large, cable provided – in this newer form – *a signal importation service.* Not surprisingly, broadcast television began at this point to demand the regulation of cable T.V.

Finally, in the late 1960s, as cable entrepreneurs began to eye large urban markets and as the public began to extrapolate from the programming cable was offering by itself, CATV began to be viewed as a major communications technology, one capable of offering a wide range of television alternatives, even of new communications services. To a degree, this perception was faddish and exaggerated. The cable television industry was and still is tiny, its financial resources perpetually strained. The largest cable company is about the 1,000th largest corporation in America; the entire industry is the size of the 279th largest single corporation in the U.S.; put another way, the cable industry's gross revenues are about the size of broadcast television profits. As is the case with most *new* technologies, perceptions of cable television's potential have outrun the cable industry's ability to deliver. But the perceptions themselves are probably accurate for cable television is not inevitably a supplement to broadcast television. It may be a significant medium of communications in its own right, one which has characteristics such as high capacity, guided signals, and two-way capabilities, and one which, because of these characteristics, may offer entirely new communications services.

Naturally enough, as cable television has gone through this evolution, regulatory and public policy perceptions have also changed. *Originally* the FCC ignored cable television. Indeed, it explicitly ruled, at one point, that it had and sought no jurisdiction over the new medium. At the same time, local communities welcomed cable television, which made something that was valued – broadcast television – available to their citizens.

Later, however, as cable television companies offered signal-importation, as well as mere transmission, services (and thus began to cut into the markets of local broadcast television stations), the Federal Communications Commission began to pay attention. During this period, the FCC assumed jurisdiction over cable television and viewed it largely as a supplement to broadcast television, a supplement which should not be allowed to endanger the television structure the FCC had erected.

Then, in early 1972, the FCC promulgated new rules regarding cable television, rules which were almost schizophrenic in that they tried to foster the potential of cable television within the structure of the existing communications industry. Much of the FCC's 1972 ruling is devoted to defining what broadcast television signals cable television may carry and as

such represents a complex mixture of industry lobbying and FCC views of the appropriate communications structure. This portion of the rules is crucial in that it determines the fundamental economics of cable television. It is estimated, for example, that a liberal signal-importation policy could lead to national penetration of 54% by the end of the decade whereas the present FCC rules will lead to, at best, national penetration of 30%–35% by the end of the decade. However, other parts of the 1972 ruling seem to involve a sense on the part of the FCC that cable television is an independently valuable communications technology. Here, the FCC requires certain minimum capacity; two-way capability; free channels for education, city government, and the general public; and access by independent entrepreneurs to cable channels by lease.

To a degree, these two views of cable television embodied in the 1972 ruling are necessary: Cable both makes new communications services possible and competes with broadcast television. But they are also in conflict. As communications technologies converge, every step taken by the FCC to encourage the evolution of one technology will cut into the market of another. And in cable television's case, a central part of every public policy issue will be the continuing market conflict between cable and broadcast television.

At more local levels of government, policy has evolved differently. It should be understood to start with that while the FCC determines broad policy and market structure, local government normally determines to whom a cable franchise will be awarded, and on what terms and conditions – a not insignificant set of decisions. At first, as stated before, local governments welcomed cable television as a simple but valued service. But after the development of major scandals centering upon the manner in which cable franchises were granted, and more importantly, after cable television came to be perceived as potentially significant, the manner by which franchises are granted has tended to change significantly. Now such awards frequently involve fairly elaborate studies, careful definition of the plans of the operators, and rigorous drafting of local ordinances. However, this attention varies significantly with the size of the community, the sophistication of local officials, and the degree of pressure put on local officials to award a franchise.

What, in my judgment, has been lacking in national or local regulation of cable television has been an explicit policy toward it – a sense of what it is, what it is good for, and where it is going. However, in the release two weeks ago of its Cabinet Committee Report on Cable Television, the White House's Office of Telecommunications Processing took a major step toward initiating debate on these questions. In its report, the authors perceived cable as developing in a specific direction shaped by three fundamental recommendations. First, the report recommended that ownership of cable systems and programming on cable channels be

separated; in other words, that cable develop as a limited common carrier of communications services. Second, the report recommended that restrictions on cross-ownership in the media be lifted – in other words, as I interpret it, that competitive opposition to cable's evolution be accommodated by allowing the opposing parts to join. Third, the report argued that government involvement not be permitted in the content of cable programming. In summary, the report looks to the development of communications utilities through which the public and private sectors can offer services to consumers and citizens. Finally – and perhaps of most immediate interest here – the report prepared a large-scale demonstration project or experiment, with the aim of seeing whether or not cable television really could deliver public services of any value.

## THREE PARAMOUNT QUESTIONS

In this overly quick sketch of public policy in this field, I define three paramount questions of continuing interest and relevance to us all:

1. Is cable television going to make it? That is, does cable television offer sufficiently attractive services to be purchased by a large number of subscribers?
   This is a public policy question since cable television does not operate in a free market but like any other regulated industry, in a market determined by regulatory policy. The FCC's rulings on signal importation and pay TV will determine cable's future. Obviously, this question only matters to us if we determine independently that cable offers anything of public value.
2. In what direction is cable television going to develop – what market structure, under what rules?
   Here we are beginning to see answers, if only dimly. The OTP Report envisions the development of cable television in a forum which should permit wide access, by all who wish it, to the possibilities the technology offers. But it also envisions a technology which the public sector pays for.
3. Does cable offer anything? Does cable offer new services – specifically, public services – which are of significant value?
   It seems to me that at least two general problems arise under this rubric: First, potential public services must be tested, and such tests will probably have to be publicly supported. There will have to be experiments, demonstration projects, and test beds – all of which have been supported by the recent cabinet report mentioned earlier. But, second and more significant, there must be substantive ideas as to which experiments, tests, or demonstrations are worth trying. And in the field of education, that is a problem only educators can begin to meet. It is also what this conference is fundamentally about. What value for higher education does this technology possess and what

should our next steps be? In my own judgment, future public policy and regulatory policy for cable television depends upon the answers to this question.

# CHAPTER 3

# Cable Television Hardware: The State of the Art

by John E. Ward

## TRADITIONAL CABLE TECHNOLOGY

Traditional Community Antenna TV (CATV) systems, of which some 3,000 are now in operation, use well-sited master antennas to pick broadcast TV signals from broadcast TV stations at the highest possible quality level and deliver them via cable to the antenna terminals of subscriber TV sets in place of the signals which might be picked up with individual antennas.[1] Since the usable range of cable frequencies extends only slightly above the upper-band edge of VHF Channel 13 of 216 MHz (currently to 300 MHz in the best systems), carriage of UHF-TV frequencies (470-890 MHz) is not feasible, and UHF stations, if carried, must be translated to VHF channels that can be tuned by the subscriber TV sets (or cable converters, as will be described). If the standard TV set is the only subscriber device, a traditional CATV system is thus limited to a maximum of 12 channels (VHF Channels 2-13).

Since traditional CATV systems were only concerned with program distribution, they early adopted the "tree" network structure, analogous to the water and electric power distribution networks. As shown in Fig. 1, off-the-air and local origination signals (if any) are processed at the "head end" (frequency translations as necessary, amplification, and so on) and

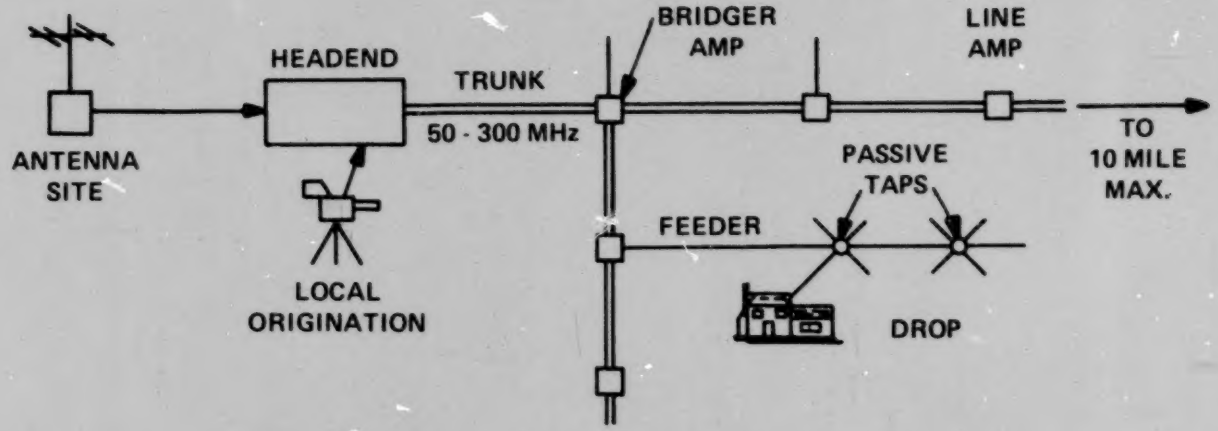



Fig. 1 Tree-Network CATV System

applied to a trunk cable, which is typically an aluminum-sheathed coaxial cable 0.5-0.75 inch in diameter. Trunk-line amplifiers are inserted about every 17 db of signal attenuation, or roughly every 1,500 feet, and because of loss of signal-to-noise ratio of each amplification, amplifier cascades are limited to about 50-60 amplifers total, or 10-15 miles of trunk.

Some of the trunk amplifiers are "feeder" or "bridger" amplifiers which also provide isolated outputs for 2-4 sub-trunk or feeder cables, typically 0.412" in diameter. Subscriber drop cables (typically 0.250") are connected only to feeder cables, using passive splitters. The engineering and maintenance of an overall distribution cable system, which must maintain proper signal levels and quality for all channels at each subscriber terminal, is a difficult task. Particular problems are the two-to-one increase in cable attenuation from Channel 2 to Channel 13, temperature effects on cables and amplifiers, distortions and nonlinearities, reflections, and proper shielding and grounding.

## INCREASED CHANNEL CAPACITY FOR DISTRIBUTION

As has been described above, a traditional tree-structured, single-cable system should have a capacity of 12 program distribution channels. Unfortunately, not all 12 channels are always usable in urban environments because of "on-channel pickup", an interference created in a TV-set tuner between strong VHF stations and the same channels on the cable as a result of leakage pickup in the TV set of the off-the-air signals. The interference is manifest by ghosting due to a time difference between the direct-pickup and cable signals, and when this occurs, it is necessary to abandon use of the local station channels on the cable and translate their signals to "quiet" VHF channels in the same manner that UHF stations are carried on the cable. The actual total of the program channels that can be carried on a traditional single-cable CATV system may be as few as six or seven in the major markets with many VHF stations.

It should be noted that the on-channel pickup problem is not a fault of the cable system, but is a result of the fact that TV sets are designed for broadcast use, for which shielded front ends have never been necessary. The cost of adding proper shielding in new TV set designs is nominal, and a number of set makers now offer shielded sets with special 75-ohm input jacks for cable use, in addition to the standard 300-ohm antenna terminals. However, it is estimated that it would take at least 10 years to turn over a substantial fraction of present sets, even if only shielded sets were produced from now on, and shielded sets thus cannot be relied on as an immediate solution to the on-channel interference problems.

*Dual-Cable Systems:* The first solution to this "lost channel" problem in CATV was simply to install two parallel cable systems (including subscriber drops), each carrying different programs on the usable channels,

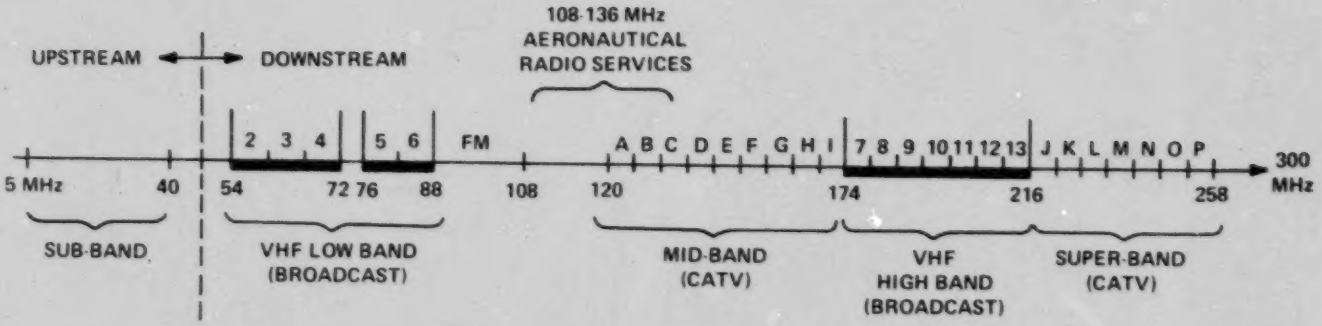
and provide each subscriber with an A/B switch to select between cables. A number of current systems are of this type and many new ones are planned. A typical dual-cable system is the one in Malden, Massachusetts, which has 18 usable program channels (three channels are lost on both cables due to the strong signals of Boston stations on Channels 4, 5 and 7). Installation of two cables at the same time costs about 50 percent more than a single cable.

*Channel Converters:* A second approach to the lost-channel problem is the set-top converter, an additional piece of equipment provided to each subscriber, which fits in the cable drop ahead of the TV set and performs all or part of the tuning function, analogous to the first UHF converters in the early 1950s. The first models (1966) were VHF/VHF converters, which handled only the 12 VHF broadcast channels and whose main purpose was to permit channel tuning to be performed in a shielded environment rather than in the TV set. The converter output is at a fixed channel frequency chosen for minimal interference (no local VHF station), and the TV-set tuner is left tuned to this channel. VHF/VHF converters eliminate on-channel carriage problems and yield 12 usable channels under all conditions.

More recently, new "augmented-channel" converters have appeared which provide increased cable channel capacity by tuning additional "cable" channels placed in the large frequency gap between Channels 6 and 7 (the "mid-band" channels) and/or above Channel 13 (the "super-band" channels). Figure 2 shows the total cable spectrum from 5-300 MHz, and indicates both the fixed FCC broadcast channel assignments for VHF-TV, and the ad hoc usage of other frequencies that is generally (but not universally) accepted within the cable industry. Note that use of *any* frequencies other than VHF Channels 2-13 requires some sort of special added tuning device for each subscriber, since TV sets tune only Channels 2-13.

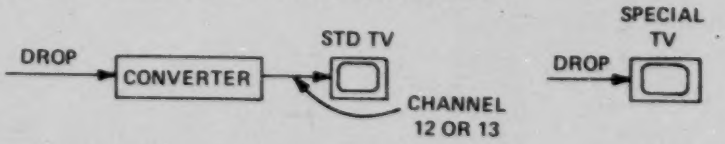
Augmented-channel converters are of two types – tunerless "block" converters and tuner-type converters. The block converters usually translate a group of seven mid-band or super-band cable channels to "high-band VHF" (Channels 7-13) for tuning by the TV set, although one type converts cable channels to an unused portion of the UHF band for tuning by the UHF converter of the TV receiver. Block converters have a switch which in one position permits normal channel reception and in the other substitutes the translated channels. Note that on-channel interference problems still exist with block converters which translate to high-VHF band because the TV set does the actual channel tuning.

The augmented-channel converters of tuner-type are similar to the shielded VHF-VHF converters previously described, except that the tuner is designed to handle more than 12 channels. Typical models presently in use are designed to tune nine mid-band channels (120-174 MHz) and four

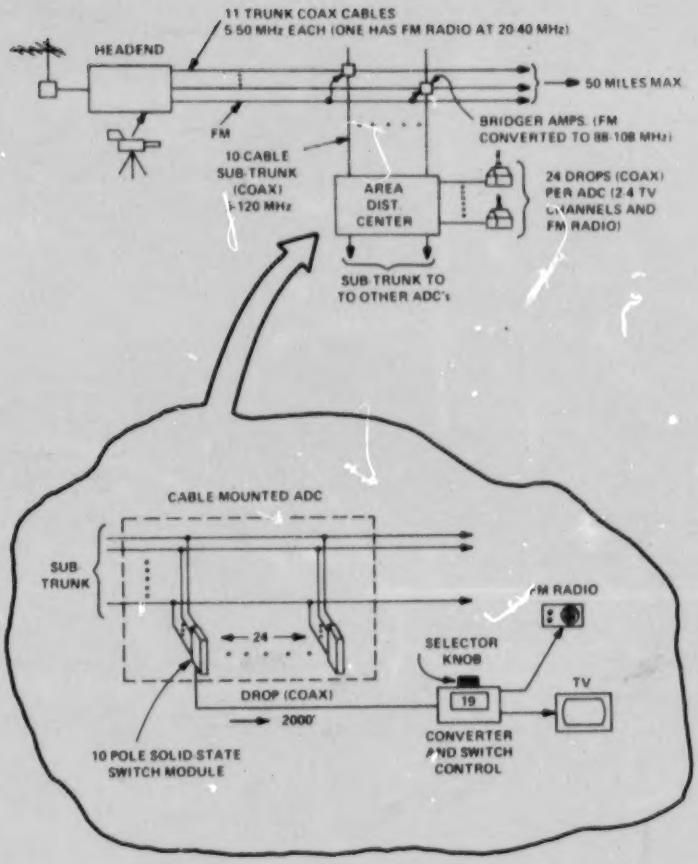



1. USE OF SUB-BAND FOR 3-4 UPSTREAM TV CHANNELS PLUS DATA REQUIRES ADDING FILTERS AT EACH CABLE AMPLIFIER, AND AN UPSTREAM 5-40 MHz AMPLIFIER ABOUT EVERY OTHER DOWNSTREAM AMP.

2. USE OF MID-BAND AND SUPER-BAND REQUIRES EITHER A CONVERTER PER SUBSCRIBER, OR SPECIAL "CABLE" RECEIVERS THAT WILL TUNE THESE BANDS




3. NO BANDS OTHER THAN 2-13 STANDARDIZED AT PRESENT. FAA FEARS POSSIBLE INTERFERENCE FROM DEFECTIVE CATV SYSTEMS AND MAY RECOMMEND NO USE OF MID-BAND




DISCADE IS A COMBINATION FREQUENCY AND SPACE SWITCHING SCHEME. THE SELECTOR GOES THROUGH THE TWO (OR FOUR) CHANNELS ON ONE SUB-TRUNK CABLE, AND THEN SIGNALS THE SWITCH MODULE TO CHANGE THE DROP TO THE NEXT CABLE, ETC. CAPACITY IS 20 (OR 40) TV CHANNELS.

**Fig. 4 Ameco "DISCADE™" System**

super-band channels (216-240 MHz), in addition to the 12 VHF channels, or 25 total. Here again, technical problems have arisen – trouble is being experienced with inter-channel interference effects (harmonics, intermodulation, images, and so on) between these new channels and the standard VHF channels and it appears that not all these 25 channels can always be used, at least with the present ad hoc frequency assignments for the new cable channels.[2] New converter designs are now appearing that are designed to counteract cable interference problems. These new converters tune 30-36 channels and cost about $40 each in quantity. Probably no more than 300,000 converters of all types are yet in use.

Note that the converters just described can also be used on dual-cable systems, immediately providing up to 36 channels per cable, or up to 72 channels total. A number of "high-channel-count" systems now being installed or planned are taking this approach for several reasons:

(a) a dual-cable system gives a capacity of 12-18 channels even without converters and the systems can start up this way
(b) capacities of up to 72 channels can later be obtained by adding presently available converters.
(c) a dual-cable system affords maximum flexibility for possible advances in two-way cable uses (to be described later)

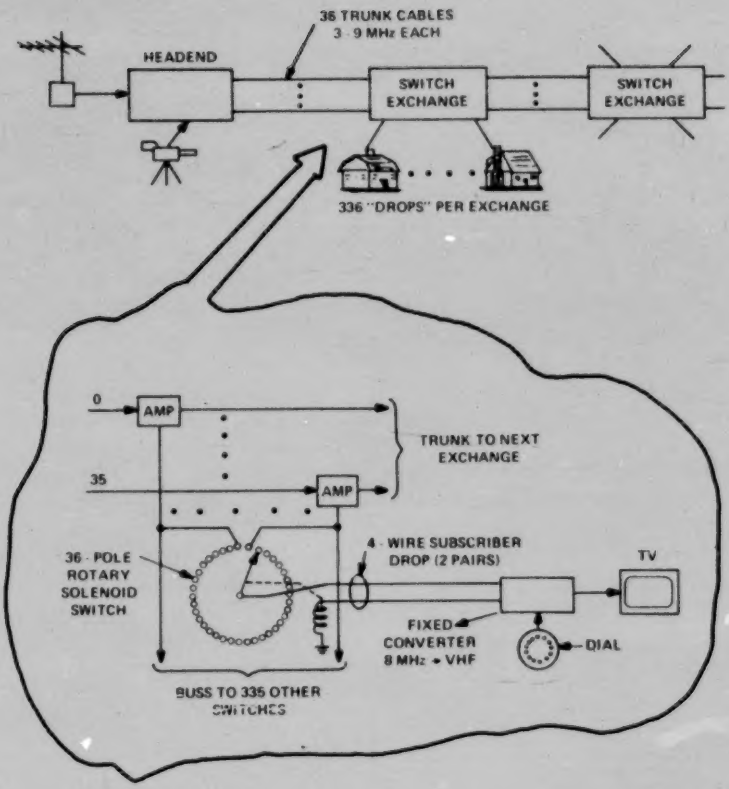
As a final comment on converter systems, it should be noted that use of two tuners in cascade (one in the converter, one in the TV set) is hardly the ideal situation from either the cost or the performance viewpoints. It would obviously be much more desirable to have cable TV sets which directly tuned all cable channels, contained the necessary shielding, and were designed to avoid a host of other cable interference problems not mentioned above–adjacent channel pickup, image reception, beats due to oscillator radiation from adjacent sets, IF beats, intermodulation, and so on. One such set announced by Magnavox at the 1971 National Cable Television Association Conference tunes 101 channels (including UHF). However, this raises the interesting question as to who should own such special receivers–the cable system or the subscriber? Also, cable channel frequencies other than the 12 VHF broadcast frequencies are still unstandardized and subject to a good deal of discussion at the present time because of (to list a few factors); continuing technical problems, competing two-way concepts (to be discussed later), and the present opinion of the FAA that cable systems should be prohibited from using any aeronautical navigation or communication frequencies (108-174 MHz), because of the potential danger of interference with aircraft operations in case of a cable break. Large-scale production of special cable receivers (or of cable converters) will depend on solutions to these questions. The FCC Cable Television Advisory Committee (CTAC) is studying the cable spectrum and is due to make its recommendations by the end of 1974. An EIA committee (CTSC) is expected to issue

recommendations for cable receivers in early 1974.

*Switched CATV Systems:* The third solution to the lost-channel augmentation problems has recently been put forward by at least two companies – Rediffusion, Ltd. (a British company) and Ameco, Inc. (Phoenix, Arizona). Their idea is to abandon the concept of a broadband, frequency division multiplex "pipe" into every home, with each subscriber having his own demultiplexing equipment (a tuner), and go to a switched network in which the subscriber drop carries only 1-4 channels, and the programs on these channels are switched remotely. By utilizing only "sub-band" frequencies below 50 MHz (i.e., below Channel 2), a switched system avoids all the interference problems of the systems described above. In addition, a switched system offers almost unlimited channel capacity, determined only by the number of channels available at the switching center and the size of the switch.

The basic implementations of the Rediffusion "Dial-a-Program" and Ameco "DISCADE" systems are shown in Figs. 3 and 4. Note that a distribution trunk is still required in both cases to feed the exchanges, and that the switched network really only replaces the broadband feeders and subscriber drops, with all thier associated bridger amplifiers, splitters, and so on. Note also that this residual trunk is implemented differently than in traditional systems–a coaxial cable per program channel in the Rediffusion system, and a cable per two or four channels in the Ameco system. However, these can be small-diameter cables because of the low attenuation in the 5-50 MHz band, and trunk costs are only slightly higher than for a single, large-diameter, frequency-multiplex trunk. The hub networks between the switches and the subscribers are also small-diameter cables, and in the case of Rediffusion, not a coaxial structure at all but a twisted-wire structure not unlike telephone cable. The Rediffusion cable is called *Qwist*™ and consists of four wires twisted together – two 25-gauge and two 26-gauge. The 25-gauge pair is usable from 0-15 MHz, and the 26-gauge pair (originally planned for control signals) from 0-6 MHz. For feeders from the exchanges, a cable with six Qwists in one sheath (3/8" diameter) is used. Individual Qwists are used for the final subscriber connections. The present limit on maximum subscriber distance from an exchange is 2,000-2,500 feet unless individual line amplifiers are fitted, thus, the exchanges are small and widely dispersed compared to telephone practice.

These present switched-system implementations offer a sound technical solution to the problems of supplying 36-40 (or more) high-quality program channels, and of channel security (for pay-TV, for example). They also offer the possibility of using simplified TV sets (no tuner required), and Rediffusion states that a per-set saving of up to $30.00 is possible, which will about pay for the subscriber program selector device. The disadvantages of the switched systems are the greater




DIAL-A-PROGRAM IS A SPACE-SWITCHING SCHEME. THE PROGRAM EXCHANGES ARE PART OF THE TRUNK SYSTEM, AND EACH REQUIRES ABOUT 100 SQUARE FEET OF PROPERTY AND A SMALL BUILDING OR ENCLOSURE. THE PRESENT 336 - SUBSCRIBER, 36 - CHANNEL DESIGN WOULD BE INSTALLED ABOUT 10 PER SQUARE MILE IN TYPICAL URBAN AREAS. THE SUBSCRIBER DROPS (UP TO 2000') ARE A SPECIAL TWISTED-WIRE CABLE.

**Fig. 3 Rediffusion "DIAL-A-PROGRAM™" System**

complexity of the subscriber-drop system (and its greater bulk, which is especially important in underground installations), the added cost of the switchgear, and the fact that homes with more than one TV set to be used independently must be double or triple subscribers (Rediffusion estimates that 40 percent of homes will need more than one house drop and exchange switch). In the case of Rediffusion, a further problem is that ground sites are needed for the exchanges (the Ameco system is entirely cable-mounted). Cost analyses[3] indicate that the Ameco system presently costs perhaps 15 percent more per subscriber than frequency-multiplex methods of supplying 40 channels, and Rediffusion about 90 percent more.

From the point of view of this conference, it is of interest to note that a 12-channel Rediffusion Dial-a-Program system (somewhat modified from the preceding description) has been in operation at Case-Western-Reserve University, Cleveland, Ohio, for the past 18 months. This system, used in the medical school, currently has 60 outlets and transmits color TV in the French SECAM system (programs are prepared in NTSC standards and then converted to SECAM before storage on tape cassettes for system use). A viewer may not only select a channel, but remotely control the video tape recorder; rewind, fast-forward, and so on. A mobile "studio" mounted on a golfcart can move around the campus and transmit programs back to the taping center via the two-way capabilities of the system.

## C. TWO-WAY CABLE USAGE

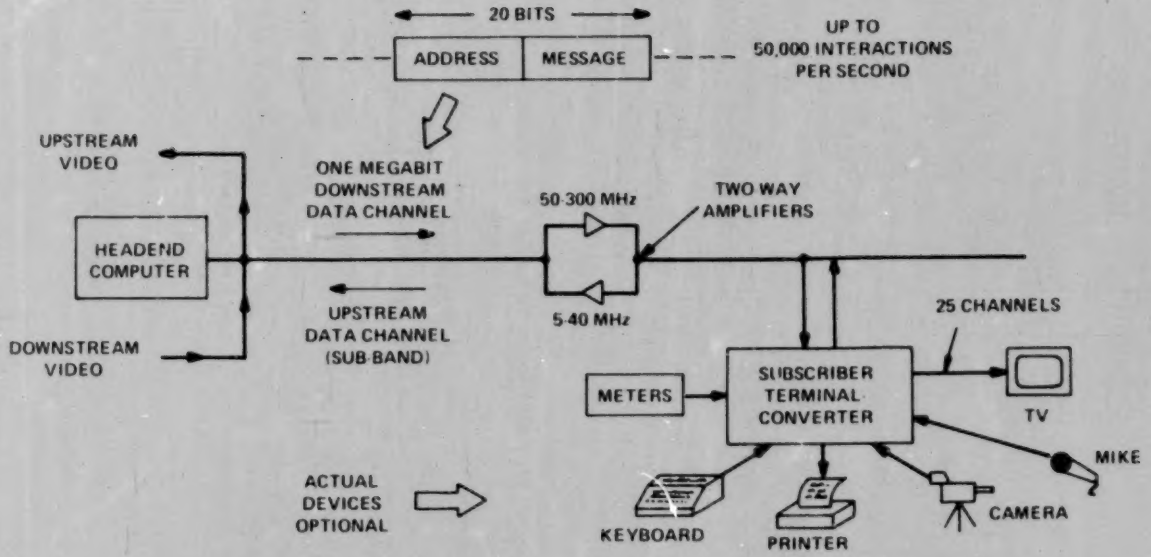
A large number of CATV equipment manufacturers now offer two-way cable amplifiers designed to permit the sub-band range of frequencies (roughly 5-40 MHz) to be transmitted upstream, that is, from the subscribers towards the system headend, on the same cable on which frequencies above 50 MHz are being transmitted downstream. Few of these amplifiers are still operaitonal and in fact only a few tens of miles of cable are involved in various tests and demonstrations, some of which indicate that there are technical problems yet to be solved in bi-directional cable systems. One of the main problems is that there is a different noise problem in the upstream channels than in the downstream channels. In the downstream case, each amplifier receives its input from a single cable leading from a previous amplifier, and input signal-to-noise (S/N) ratio can be closely controlled. In the reverse (upstream) case, however, a number of branches in the tree typically converge on the input of each upstream amplifier, and the noise from these branches is additive across the upstream band. One source of interference affecting the upstream data channels has been identified as broadcast signals from radio stations in the 5- to 50-MHz band leaking into the cable sytem, particularly at the cable

connectors and improperly terminated house drops. Apparently, a two-way system requires much more careful attention to shielding design and maintenance of shielding integrity than a downstream-only system.[4]

The above simply indicates that upstream transmission in CATV systems is barely under way, and that some unexpected technical problems are being encountered in the initial hardware configurations. These problems appear to be amenable to solution, however, and it may be expected that two-way cable technology will be on a very solid footing with five years, and that there will be a substantial number of installations within that period. In fact, the FCC in its new CATV Report and Order, which became effective March 31, 1972, states that two-way capability "at least on a non-voice basis" will be required in all systems in the top 100 markets by 1977. What sort of two-way capability has not been stated more explicitly by the FCC at this time. If and when the FCC becomes more explicit, the required two-way capabilities will probably be along the lines discussed in the paragraph below.

With perhaps 30 MHz of upstream bandwidth available on a cable, no more than four upstream TV channels can be fitted in and still leave room for upstream data (and perhaps audio) channels. These four TV channels must of course be shared by all subscribers on a given cable, or looking at it another way, no more than four upstream originations can be taking place at the same time per cable. The two-way CATV cable thus provides considerable capability for remote TV origination from any point in the sytem, but just does not have the channel capacity for private, two-way video conversations in the telephone sense. That capability requires a separate two-way channel per subscriber, which can only be obtained with a hub-type, switched cable network.

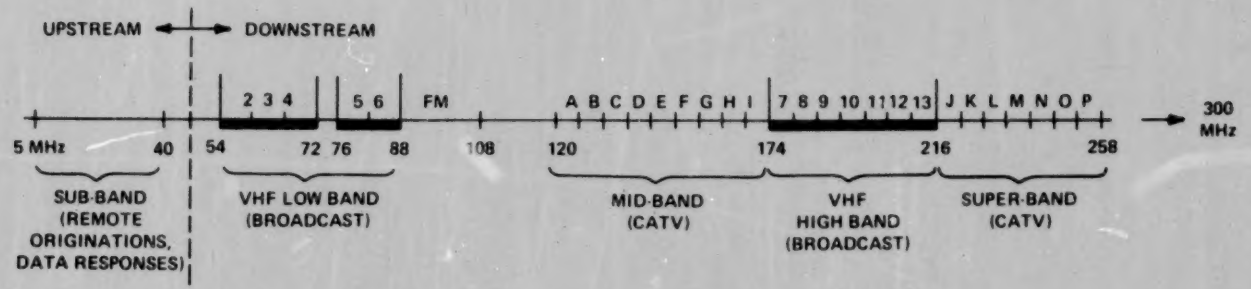
Data transmission capability on a two-way cable is quite extensive, however. Several manufacturers now offer head-end and home terminal equipment which provide time-division-multiplex operation at one megabit per second. As shown in Fig. 5, a single common downstream channel is used (which might be, for example, the unused 4-MHz guard band between VHF Channels 4 and 5), and a single common upstream channel in the sub-band, also of about 4-MHz bandwidth. Each message carries a digital address field, which is recognized by the particular terminal for which it is intended. Messages may contain data for a terminal, control signals for a terminal, or a request for specific input from the terminal (meter readings, etc.), or may be simply a "poll" asking if the terminal has any input and authorizing its transmission in the immediately following time slot. Upstream transmission from a terminal can be identified either by its timing relative to a head-end request, or can also include terminal identification. Assuming that each head-end or terminal transmission consists of 20 bits (12 bits of address, 8 bits of data), and cable propagation time factors are properly handled, all subscribers on a



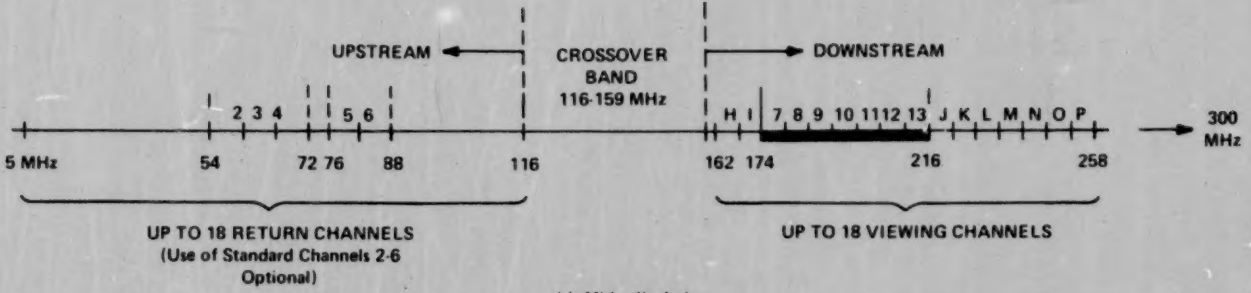

TYPICAL TWO-WAY SYSTEM AS NOW CONFIGURED BY VICOM, INC. (BEING TESTED IN OVERLAND PARK, KANSAS) AND BY HUGHES THETACOM (BEING TESTED IN LOS GATOS, CALIFORNIA).

ANOTHER CONCEPT BEING TESTED BY MITRE CORP. IN RESTON, VA., INVOLVES A "FRAME GRABBER" (TV TAPE OR DISK RECORDER) TO RECEIVE AND DISPLAY ON THE TV SET SINGLE, ADDRESSED, TV FRAMES. DIFFERENT FRAMES CAN BE SENT TO 60 SUBSCRIBERS EACH SECOND.

**Fig. 5 Two-Way Concepts**




a) Low-split design for single-cable. CATV system




b) Mid-split design

**Fig. 6 Comparison of low-split and mid-split cables**

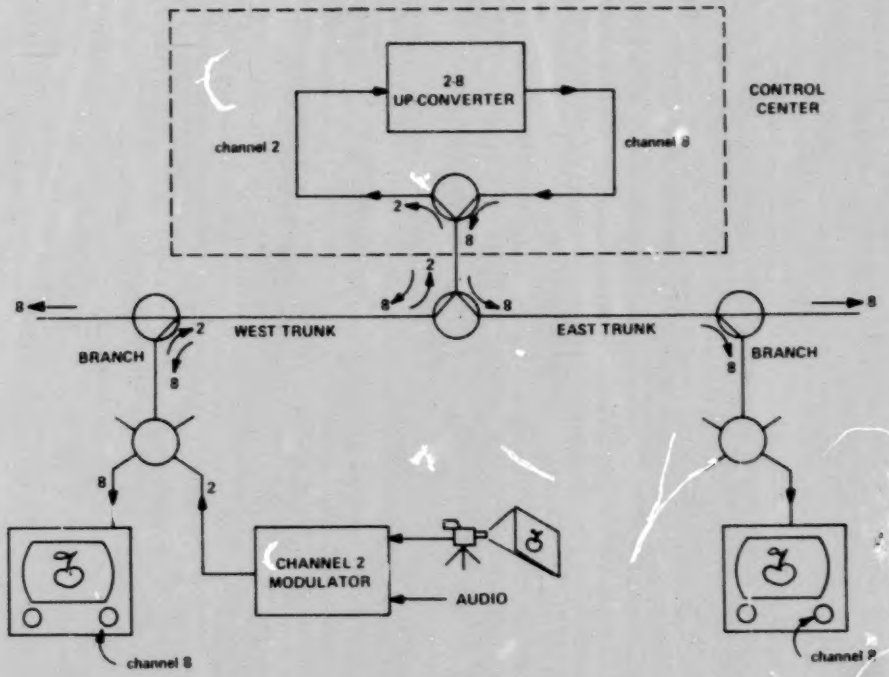
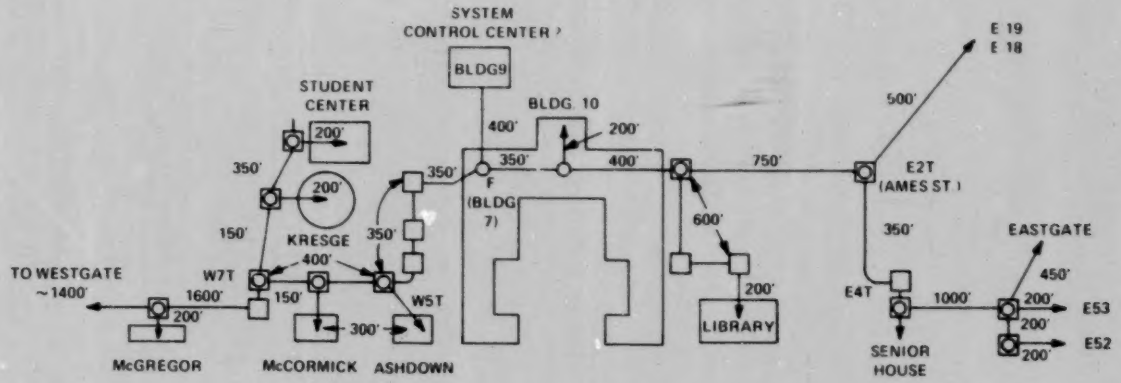



**Fig. 7 Control center conversion of remote origination channel to viewing channel**




TOTAL CABLE FOOTAGE SHOWN = 11,600'

| WEST | EAST | |
|---|---|---|
| 350 | 400 | (9 → 7) |
| 350 | 350 | |
| 300 | 200 | |
| 300 | 400 | |
| 400 | 600 | |
| 350 | 200 | |
| 200 | 750 | |
| 200 | 500 | |
| 150 | 350 | |
| 1600 | 1000 | |
| 200 | 450 | |
| 1400 | 600 | |
| 5800' | 5800' | |

○ = SPLITTER

□ = MANHOLE & NUMBER
W7T

**Fig. 8 First-cut back-bone cable routing for MIT**

4,000-subscriber trunk (or separate 4,000-subscriber data channel on a larger trunk) can be polled five times per second, and each subscriber can thus be provided a simultaneous and continuous two-way data transmission capability of 50 bits per second. If the data channel control is organized so that the available channel capacity can be allocated only among those terminals that are active at a given time, data rates of up to 5,000 bps or more per terminal are feasible, depending on the total data traffic.

An average, simultaneous capability of 50 bps per subscriber will provide sufficient data capacity for almost all of the proposals that have been made for home data services (alarms, meter reading, channel monitoring, home shopping and banking, information access, etc.). As shown in Fig. 5, a wide variety of input/output devices may be part of the subscriber terminal itself, or may be provided as options that may be connected to a "basic" terminal. These include keyboards, soft-copy displays, hard-copy printers, and interfaces for other in-home systems (meters, fire alarms, and burglar alarms). Several of the new terminals coming on the market also provide a few controlled-access audio channels, which permit voice as well as button response in TV teaching situations (one such system has been tested experimentally near Kansas City). They also may be used as party lines to permit "conference call" hookups for any desired group of subscribers, in combination with a video channel allocated to the group for the duration of its conference. A further capability of these systems is channel-access control, which can be used for pay-TV, or for other limited-access programming (medical networks, and others).

Also noted in Fig. 5 is a new concept called "frame grabbing," which requires that each subscriber using this service be equipped with a write/read storage device (magnetic video tape or disk) that can capture one TV frame on a cable channel and then continuously play it back at the proper flicker-free frame rate (30 or 60 per second) for as long as a minute or more for viewing on the TV set. Each such frame is preceded by a digital address code that causes the proper subscriber terminal to record it (this address function can perhaps be combined with the same function on a data terminal if there is one). In the demonstration of this concept by Mitre Corporation,[5] each interlace field (262 lines, 1/60 second) is separately addressed and can be a picture or a text display with up to 800 alpha-numeric characters. For just one "frame grabber" channel, this yields a capacity of 216,000 individually addressed text or picture frames per hour, or 172.8 million characters per hour in text-only mode – a truly enormous information transfer capability. Costs for the necessary subscriber recorder/playback device currently are in the $500-$1,000 range, but this might eventually be reduced to $100 in high production.

A further concept based on the "frame grabber" approach is to time

multiplex a number of "moving" TV pictures on one channel, but with each such picture transmitted at a much slower rate than usual. For example, if each complete TV frame (2 interlace fields) were separately addressed, and a given subscriber received three new frames per second, then 10 different subscribers could each receive a different "stop motion" video signal on the same channel. Just as in the "frame grabber" described above, a subscriber storage device would be needed to capture each new frame and replay it at the proper 30-per-second viewing rate until the next frame was received. The visual effect would be a bit jerky, but probably acceptable for many purposes not satisfied by one-frame-per-call "frame grabber" services, and not warranting a full, dedicated TV channel.

*Present Status:* Once the technology of two-way data links as described above is firmly established, as appears certain will occur within two or three years at most, the main constraints on installation and use of this technology will be the cost of the home terminal devices ($100 to $1,000, depending on function), and the growth of data services that a subscriber may have access to. This is very much a "chicken or the egg" situation, since subscribers will only be interested in paying additional monthly charges for two-way terminal equipment when there are available services that they would like to use and these same services are unlikely to develop until there are enough subscribers ready (and equipped) to use them to make them worthwhile. It is clear that two-way services will emerge over the next few years, but their rate of growth is extremely hard to predict at this time.

## CABLE IN THE UNIVERSITY

A cable system in a university can, of course, be organized just like those that have been described for bringing cable programs to subscriber's homes, and, in fact, some universities have proposed systems in which they become part of neighborhood cable systems carrying primarily entertainment programming, and the universities' needs for special programming are met with extra channels, some of which may be seen throughout the system. At the other extreme, universities may install specialized configurations that are entirely internal in coverage, and are optimized to the purpose at hand. The switched system at Case-Wester-Reserve previously described is an example of this type.

Thinking about a possible broadband cable system within M.I.T. is somewhat similar to that at Case-Western-Reserve, but is currently based on a variation of the two-way, tree-structured cable systems that have been described. The idea is that the entire campus, which extends for two miles in the long direction, be wired with a two-way trunk providing up to 18 upstream and downstream channels at each location. For this, commercially available "mid-split" two-way amplifiers would be used,

with channel assignments as shown in Fig. 6(b). A program originated at any location would be distributed to all other locations by sending it upstream to a control center, where it would be frequency-converted to a downstream viewing channel and sent out over the system. This procedure is shown in Fig. 7. Note that the control center would be in the middle of the system.

Figure 8 shows a preliminary version of an M.I.T. trunk network that would interconnect all major lecture rooms, libraries, and housing units. Excluding distribution wiring within buildings, it is estimated that this trunk system could be installed and three upstream/downstream channel pairs implemented for about $30,000. Regular TV sets would be used for viewing up to six channels; converters would be needed to expand beyond six channels.

## REFERENCES

1. There are also microwave relay systems for CATV off-the-air signals, and in 1971 about 600 CATV systems received all or part of their signal inputs via microwave relay rather than their own antennas.

2. Ward, J. E. "Inter-Channel Interference and the Cable-Frequency Allocation Problem" Appendix A of Report ESL-R-449, "Present and Probable CATV/Broadband-Communication Technology", June 7, 1971. Prepared for the Sloan Commission on Cable Communications.

3. Ibid.

4. Dixon, J. I. "The Real World of Two Way", Telecable Corporation, NCTA Convention Transcript, 1972.

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# CHAPTER 4

# The Cable Industry and Higher Education

**by Amos B. Hostetter**

I think you can see from John Ward's opening comments that what we are dealing with when we talk about cable is a technology in search of a market. There is no doubt the engineers can create for us cable systems which are communication super-carriers. Today cable systems have great surplus bandwidth available for information carriage. But as a generality, the industry has not yet found the information to be carried on which it can build an economic base. Such a carrier system has been constructed, based on economics of providing broadcast television to poor reception areas, to cover approximately 12% of national TV households. But this penetration, and essentially single-purpose use, is a substantial under-utilization of the technology we are discussing here. On that basis, we have got some fraction of the country built. As an industry, we are in search of other information, the distribution of which is economically viable.

As I understand it, this opening panel is designed to give you some perspective on what many of us hope can be constructive and mutually-profitable relationship between this developing broad-band communications industry and higher education. I emphasize the word "hope," because to date that has largely been the product of our efforts. With a few limited exceptions, the record of this relationship has been

formed by the words of the communications visionaries rather than by the deeds of the practitioners. If those of us who have met and discussed this subject often before have established one thing, it is that it's time to proceed with some tangible demonstrations of cable applications in education. I believe we have already identified one pervasive source of frustration to such implementation steps. Specifically, education is today a well-established institution. Almost by definition, well-established institutions have substance and continuity because over the years they have established successful, repetitive, self-reinforcing patterns for accomplishing certain simple tasks. But this positive characteristic of institutions has a corollary negative dimension—resistance to change.

This seems to be particularly true in the critical systems for allocating funds within education today. Others are better equipped than I to review the many subtle ways in which institutional inertia has thwarted the application of new technologies to education. I do not raise this point with any hope of providing a solution or to imply my own expertise. I raise it because, as I understand it, for the first time, we have assembled here a number of the individuals best equipped to deal with this particular problem. I have great hope that, with your help, we can begin to loosen the funds-allocation system from the present near-total dependence on a system of full-time equivalencies. This seems to me to be an essential first step.

## THE PRESENT AND PROJECTED REACH OF CABLE

Bo Cutter has asked me to provide a little briefing on the current financial status of the cable industry as it bears on the cable operators' incentives, or disincentives, to develop educational applications. Let me start with a brief sketch of the present and projected reach of cable. Most recent estimates are that cable serves about eight million homes, or 12% of the 66 million TV homes in the United States today. The now four-year-old Sloan Commission Report estimated (assuming constructive regulation and a speedy resolution of certain legislative issues) that cable penetration could reach 50%, or say 35 million homes, by 1980. In my judgment, this now appears overly optimistic.

The recently released Cabinet Committee Report looks to achievement of 50% national penetration (40 million subscribers) by 1985-1990. Based on what we know today, and assuming for the moment that the industry can develop viable new services and a sufficient supply of capital, this seems to me to be a reasonable estimate. To give you a sense of my judgment on the shape of the growth curve over the next two decades, I would estimate 1980 penetration at say 18-20 million subscribers. This represents a compound growth rate of something less than 20% for the balance of this decade, and less than 10% for the decade

of the 1980s. Given the current ponderous pattern of the regulatory process and utility rearrangements, plus the obviously increasing absolute numbers involved, I doubt that we can substantially accelerate that growth rate. Those of you with some knowledge of cable may well say that I have assumed the issue away when I proposed these numbers exclusive of the problems of developing viable new services and capital availability. I agree. My intent, at this point, is merely to set some "best case" limits under existing non-financial conditions.

Let's now look at what these "best case" assumptions imply for these financial factors. Without boring you with detailed calculation, the growth rates I have described imply an average annual investment in new plant and equipment of about a half-billion dollars over the next 16 years. This investment is exclusive of replacements and FCC-mandated rebuilds. The traditional source of about two-thirds of such capital investment in our economy is our industry's own internally generated cash (after-tax profits plus depreciation). However, given the fact that the period under discussion is one of proportionally large capital formation for an industry with low profitability, it seems clear that internally generated funds will currently not provide this portion of our needs. This will be particularly true in the shorter terms, say the balance of this decade.

In my judgement, realization of the rates of growth I have discussed above will require annual *external* financing of, say, $350 million for the balance of the 1970s, and $250 million thereafter. To put these numbers in perspective, the annual flow of savings to new corporate investment in our economy runs about $30 billion a year. So we are talking about cable obtaining roughly 1% of this flow. However, you should also know that the telephone and power industry combined take about half this total, leaving about $15 billion of external funding for all other capital users. No other single industry has raised more than a billion dollars in any recent year. In summary, for cable to grow even at the relatively modest rates postulated here, it must be able to attract new capital at an annual rate of something better than a quarter of a billion dollars over the next several decades. It must do this in what most economists believe will be a protracted period of tight capital supply; we will be competing for new investor (your savings) funds against all other United States and foreign industry. Perhaps when I phrase this capital-availability issue in terms of competing for a portion of "your savings," you can appreciate that the key determinant of successful capital formation will be current and prospective profitability (i.e., return to those who provided the capital).

## CABLE'S PROFITABILITY

Well, let's take a look for a moment at what the industry's

have been somewhere between poor and none. We have raised capital in the past decade mostly on the prospects of future profit, a concept which appears out of fashion in today's money market. As a measure of how out of fashion cable stocks are, let me cite a composite index of cable stocks that Paul Kagan & Associates have completed daily for about the last four years. The high on that index was hit in August of 1972 at 48.56. In January of 1973, the number was 36.99. In December of 1973 the index hit a low of 7.12 (less than 15% of the high established a year and a half before). There has been some recovery in the last month; as of the end of this January, the index will be about 11.7. So today, the market values cable at about a quarter of the value which prevailed a year and a half ago.

Perhaps a more important measure of those indices is that the December 31 index of 7.12 represented an average value of about $145 per subscriber for the public companies involved. Since the companies are approximately 50% saturated, this $145/subscriber figure translates to a value of $72.50 per home passed. (I assume you follow the distinction between those who are subscribers and those who have the cable available to their home.) As a rule of thumb, the cable plant going into place today costs approximately $120 per home passed. You don't have to be a Ph.D. in economics to see that, given the current capital atraction and application, cable is in a non-perpetuating cycle. There is little incentive to expand for companies whose assets are valued by the market at less than book value. From another perspective, by reviewing the listing of new offerings, you can see that the cable industry has not raised any new equity in the last 12 months. A review of the public company financial statements further reveals that the industry has no more than $100 million of uncommitted borrowing power.

So there, my friends, is the context in which we must view the incentive/disincentive question Bo has posed for me. I think we can see in the management (in many cases changed management) of every one of the major cable companies an entirely new outlook on the "give aways" that prevailed in the 1970-1971 period. When capital was extraordinarily cheap, it was easy for cable operators to be philanthropists. Those conditions don't apply today. They may again at the peak of some new market euphoria for cable, but that is today only a hope. Cable managers today must try to look beyond the present through. On the other hand, they are not likely again to be persuaded that there are no tops to the mountains.

The last year has been a sobering one, a period of re-evaluation for the cable industry. Those of us who want to see cable grow, who feel that cable has an important social contribution to make, have been forced to re-examine its fundamentals. Our first-order priority, the only condition under which cable can make a contribution, is if we are first making a solid profit. In some circles, this premise is periodically in disrepute. I submit to

you that one of the beneficial results of the recent collapse of cable's capital market is that it has brought corporate managers back in touch with simple realities. We cannot spend or give away more than we have or more than we must reinvest in our enterprise to give that enterprise continuing life. Failure of the public or the regulatory process to recognize these same realities has brought a list of corporate and social disasters headed by the wreck of the Penn Central.

I don't intend to make this a disseration on business cycles, or a justification of our capital and pricing system. I merely mean to point out to you that without massive subsidies or outright nationalization, cable is a capital-intensive industry operating in a highly competitive capital market. We must reach for and achieve a profitable base of operation. Particularly in this environment, I would urge you to view cable as you view other purchased services. In this regard, I think the recent OTP Report is a particularly useful document. It attempts to focus us on thinking of cable as carrier--like a trucking, airline, telephone or telegraph service.

## CABLE MUST PAY ITS OWN WAY

In that context, cable education must pay its own way. Perhaps not directly, but at least it must be able to demonstrate that the social benefits of the capital used are justified in the competitive marketplace. It is your task, I suggest, to explore these cross-benefit relationships. Are there useful substitutions which cable could provide, other ways of doing things for which you are presently expending money? Neither you, nor I, nor any regulatory agency can view free cable use as a God-given right. Such free access or facilities represent costs on which the money market will demand a return. I urge you, in your planning and analysis of useful cable applications, to consider cable distribution costs carefully. Whether or not the return on capital so employed comes directly from your budget, some segment of the user-group will pay for these services. While investor return can be delayed, it is axiomatic that it cannot be denied. Given this perspective on the capital market on which we operate, I urge you to look upon the FCC's mandated free channels as a "3-year free trial offer." Like any other promotional offer, you have an opportunity to discover, use, and (we hope) develop a need for a new product or service. But at the end of the promotional period, unless your uses are sufficiently cost-effective to bear the full cost of providing those services, such uses cannot and should not be continued.

# CHAPTER 5

# Instructional Television in Higher Education

**by Michael Molenda**

## INSTRUCTIONAL TELEVISION IN HIGHER EDUCATION

This paper will deal, from the educator's viewpoint, with the specifically *instructional* applications of television – what higher education institutions have been doing with TV, how successful their usage has been (according to the findings of instructional TV research), and how these practices and research findings may relate to cable TV.

This will be a quick overview of a very broad universe. Let's begin by surveying the major *modes* in which TV is utilized in higher education:

- *Broadcast* – Beginning with the commercial networks' carrying "Continental Classroom" and "Sunrise Semester" in the 1950s, we have come today to the point that at least 42 higher education institutions operate some 60 broadcasting stations in the VHF and UHF bands. The primary role of most of these stations is that of a public television outlet, transmitting the resources of the university to off-campus audiences. They typically carry instructional programming for the elementary and secondary school levels, plus programs of general cultural or educational interest to the local community.
- *Microwave* – In addition to conventional broadcasting channels, some dozens of other institutions use the more specialized Instructional

Television Fixed Service (ITFS) and microwave frequency bands to reach specific off-campus groups which are especially equipped to receive these signals. One of the best-known and most active examples of the latter is the TAGER microwave network, headquartered in Dallas, which facilitates sharing of resources among nine colleges and transmits graduate engineering classes to on-the-job workers at several neighboring industrial plants.

- *Closed-Circuit TV (CCTV)* – Even more widespread than either of the above modes, though, is the practice of conveying regular coursework to on-campus students through local cable lines which may interconnect two rooms in the same building, several different buildings, or the entire campus.

  The installation of CCTV systems appears to have progressed steadily from the early 1950s through 1972, doubling in numbers approximately every five years. (See Figure 1) A survey by the Great Plains National ITV Library (1972) located some 725 CCTV systems in higher education. My guess is that this growth has probably reached a plateau at this time. There are not that many colleges left which could support a wire-up which have not done so already. Besides that, many of the functions which CCTV originally served are now fulfilled by competing delivery systems such as microwave, portable video tape units, and video cassettes.

  The relevance of these CCTV systems to our present concerns is that they represent not just a delivery system, but also a *production* capability which could conceivably be interfaced with cable TV headends.

- *Other Modes* – Finally to complete this video overview, passing mention must be given to a couple of highly localized forms of TV use. One is dial-access video, in which an individual student in a study carrel may dial up any given title from a remote bank of stored video tapes; this still tends to be a rather exotic technology, expensive to install, debug, and feed with courseware. It has caught on at only a handful of campuses.

  Another localized video tool is the portable videotape unit, or "porta-pak," which is now virtually ubiquitous. All the indications are that there are probably very few campuses which do *not* have a portable unit around somewhere, if only locked in the AV director's closet. They are particularly prevalent in education and physical education departments, where they are heavily used for "microteaching" and other forms of self-observation.

## ITV RESEARCH FINDINGS

What have we learned from these 20 years of glowing cathode ray

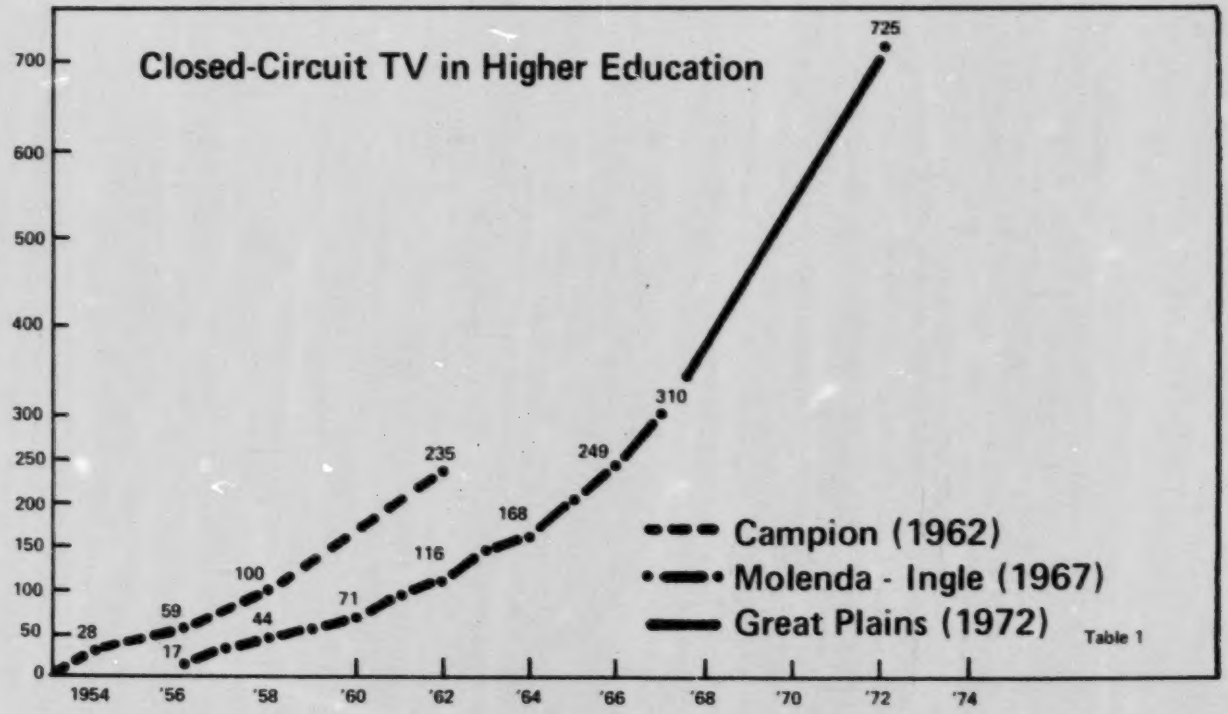
Closed-Circuit TV in Higher Education
700
600
500
400
300
250
200
150
100
50
0
1954
'56
'58
'60
'62
'64
'66
'68
'70
'72
'74
28
59
100
235
17
44
71
116
168
249
310
725
Campion (1962)
Molenda - Ingle (1967)
Great Plains (1972)
Table 1

Fig. 1

tubes? What do we know for sure? Unfortunately, not as much as we might, considering the hundreds of research studies that have been publicly reported. The problem, in the view of research methodologists, has been that the great preponderance of these have been comparison studies comparing the local version of "televised instruction" with the local version of "conventional instruction." In other words, it is asked whether can-of-worms A is better or worse than can-of-worms B. Each is so full of wriggling, slippery mysteries that no matter what the answer, it is nearly impossible to explain the significance of that answer, to use it to improve practice, or to generalize it to other situations.

Many researchers are, of course, cognizant of this problem and they have striven mightily to match the two treatments exactly on every controllable variable, changing only the means of transmission (TV vs. face-to-face). But when this is successfully done we find that both forms of instruction have been compelled to fight with both hands tied behind their backs, neither having been allowed to do what it can do best. The inevitable result: no significant difference. As Mielke's[7] recent critique so forcefully points out, this voluminous array of comparison studies has left us with little either for purposes of administrative decision making or in terms of scientific generalizations about how students learn from television.

Our overview of ITV research, then, is approached with considerable caution, because we don't know exactly how to interpret "no significant difference" or a finding favorable or adverse to televised instruction. Nevertheless, several major attempts have been made to collect and analyze the findings of studies related to on-campus relevised instruction in higher education.

The first, a comprehensive survey by Godwin Chu and Wilbur Schramm,[1] reached this general conclusion:

> So far as we can tell from present evidence, television can be used efficiently to teach any subject matter where one-way communication will contribute to learning.

Within that general pattern, though, it appears that results have tended to favor television more frequently at the elementary-secondary level than in higher education (See Figure 2).

A more recent analysis, conducted by Robert Dubin and others[3] at the Center for Advanced Study of Educational Administration, reached a similar conclusion:

> In the most intensive analysis across many studies yet made, we can find no evidence to dispute the conclusion that one-way television is as good as other college instructional media.

It is important to emphasize Dubin's distinction between one-way and two-way uses of ITV. The results of these two treatments were analyzed

separately, for reasons which will become clearer as we proceed. First, Figure 3 indicates the slightly pro-TV trend they found among the *one-way* television comparison studies in higher education. But more startling, particularly in light of our great expectations for vast improvements stemming from cable TV's two-way transmission capacity, is Dubin's conclusion that face-to-face instruction is significantly superior to two-way television (See Figure 4). We see that out of 35 independent comparisons, 77% favored the face-to-face treatment.

How can this anomalous finding be accounted for? It really doesn't seem likely that being able to communicate with the TV teacher somehow *inhibits* learning. In most of the cases studied, feedback was enabled by placing a microphone in the remote classroom; one particular study of this type was conducted by Larimer and Sinclair[6] at Penn State. They found that interation among students was inhibited, negative attitudes arose, and lower grades were attained by the remotely located students. We can only speculate as to why these effects occurred: technical problems with the audio system that made it clumsy and unreliable to use, heightened expectations which could not be fulfilled, or possibly an instructional method which was simply not well adapted to receiving and using feedback. In the absence of definitive research results, we are left only with hypotheses. All we know for sure is that there is nothing magic about an ITV system that simply allows for audio feedback. Perhaps such a system can be turned to good advantage; we have not found the best way to do that yet.

## CURRENT TRENDS IN RESEARCH

In recent years, there has been a decided drop-off in the use of the comparison method. The emphasis nowadays is on *formative,* or developmental, evaluation. This approach says, "We're not concerned with what TV is better than; we just want to find ways of improving its effectiveness here and now."

One example may suffice. Faye Dambrot[2] reported on a decade of developmental evaluation regarding a televised general psychology course at the University of Akron, a course which had enrolled some 20,000 students in that time span. Dambrot's modest claim at the end of her report is that "In a ten-year period, through trial and error learning, an efficient and effective course has emerged which is well received by students." This result was achieved by means of constant evaluation and modification semester by semester. For instance, the course was presented five times, with constant revision of content and methods, before it was videotaped the first time in 1967. According to her report, comprehensive cognitive testing and attitude measurement still continue, feeding in data for periodic revision. (By the way, for the benefit of administrators, it

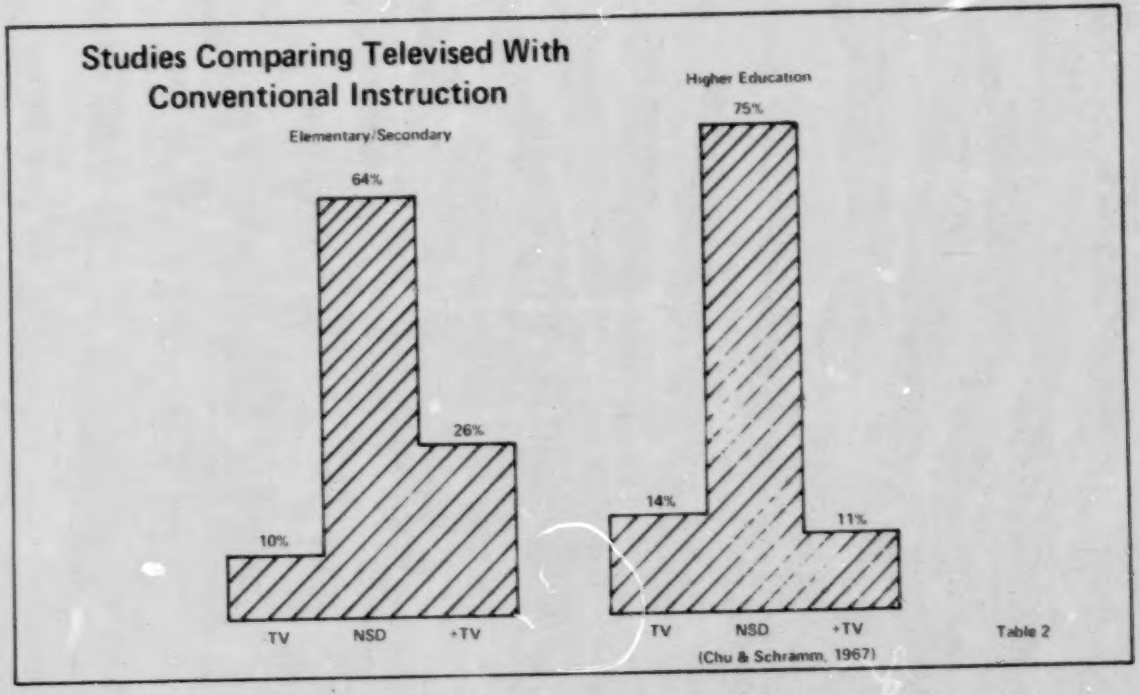
Studies Comparing Televised With Conventional Instruction
Elementary/Secondary
64%
26%
10%
TV
NSD
+TV
Higher Education
75%
14%
11%
TV
NSD
+TV
Table 2
(Chu & Schramm, 1967)

Fig. 2

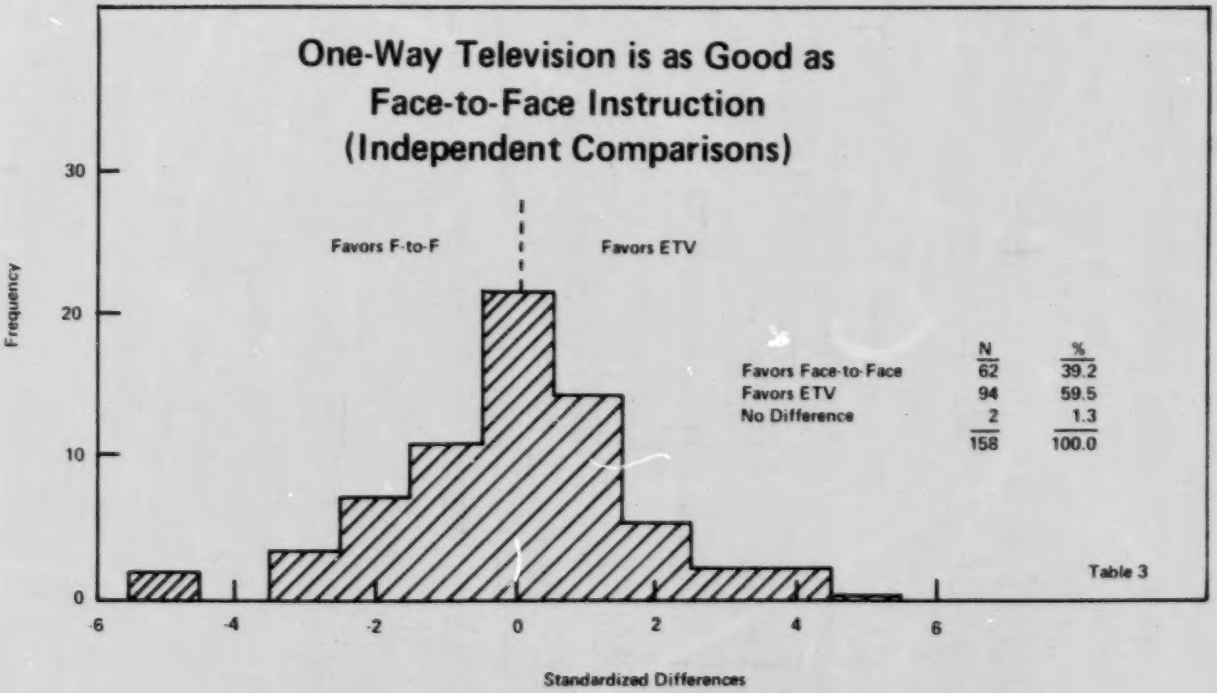
One-Way Television is as Good as
Face-to-Face Instruction
(Independent Comparisons)
Favors F-to-F
Favors ETV
Frequency
30
20
10
0
-6
-4
-2
0
2
4
6
Standardized Differences
N
%
Favors Face-to-Face 62 39.2
Favors ETV 94 59.5
No Difference 2 1.3
158 100.0
Table 3

Fig. 3

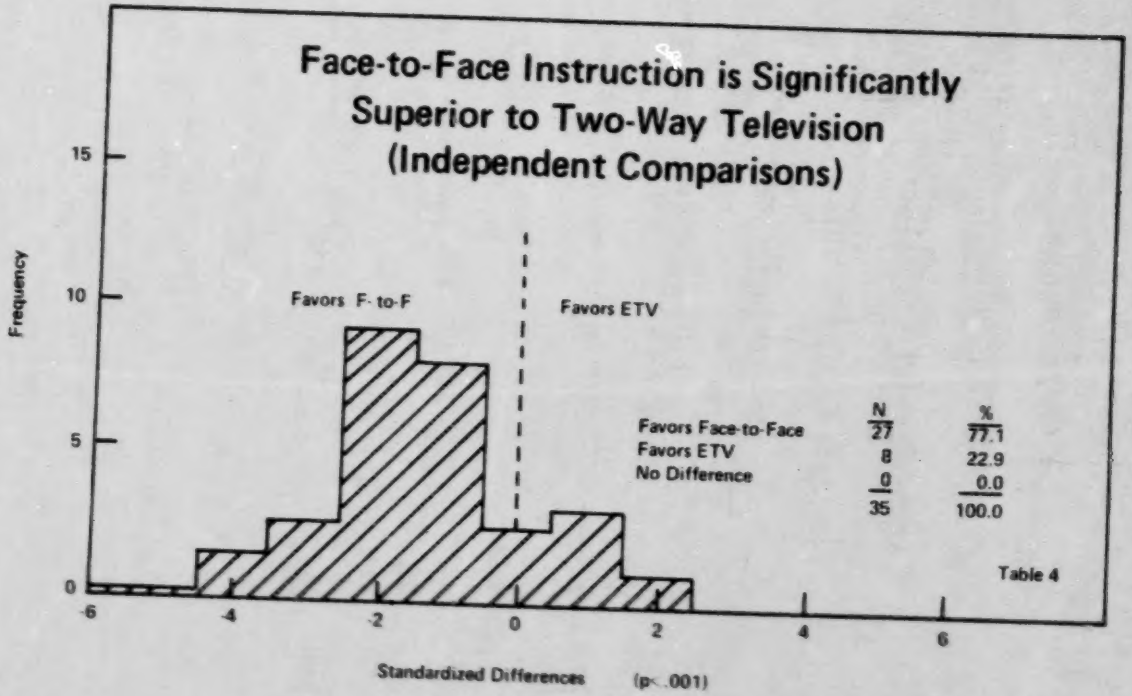
Face-to-Face Instruction is Significantly Superior to Two-Way Television (Independent Comparisons)
Frequency
15
10
5
0
Favors F-to-F
Favors ETV
-6
-4
-2
0
2
4
6
Standardized Differences (p<.001)
Favors Face-to-Face 27 77.1
Favors ETV 8 22.9
No Difference 0 0.0
35 100.0
Table 4

Fig. 4

should be noted that some 3,700 students now take this course annually under the supervision of *one* faculty full-time-equivalent.)

## THE OFF-CAMPUS AUDIENCE

Of greater interest to cable adherents, but the subject of vastly less research, is the off-campus home viewer of ITV offerings. The research evidence we have, again gleaned from the Chu and Schramm survey metioned earlier, indicates that at-home TV students do learn; in fact, they tend to perform better than thier on-campus counterparts and they frequently have a more favorable attitude toward learning via the tube. Chu and Schramm speculate that this may be a product of their generally higher overall level of motiviation. They are viewing because they want to, not because they have to.

More of the research on off-campus TV learners falls into the category of audience analysis – examination of the personal characteristics of the users of this service. Perhaps the most systematic long-term body of data on voluntary home use of ITV has been compiled by Chicago City College, which has operated an extensive broadcast ETV system for about 20 years. James Zigerell,[9] Dean of the TV College, reported several years ago on the characteristics of their typical home viewer:

- most likely a woman (75% of their students are)
- age, late 20s
- typically, a teacher (40% are now teaching or plan to)
- is highly motivated
- is enrolled for credit, and is vitally interested in attaining "credentials"

## TYING IT ALL INTO CABLE TV

One of our ultimate concerns here is whether or not there is a confluence of interest between higher education and cable TV. Our experiences to date, although still in an embryonic stage, yield at least a tentative "yes." Indeed, a recent publication of the National Cable Television Association (NCTA) lists some 65 institutions of higher education which use their local commercial cable TV systems for the transmission of educational material. So the enterprise has already begun. The range of possibilities is obviously great. For an in-depth analysis of two rather different approaches, I recommend to your attention: *Cable Television and Higher Education: Two Contrasting Experiences* by Leland Johnson[5].

Cable undoubtedly offers higher education an outlet to a new learner, the off-campus, part-time student. But besides this difference in target audience, cable offers at least two technical capabilities which are unique

to cablecasting: (a) It can provide multiple channels for simultaneous communication with multiple small audiences; (b) it can allow two-way interaction between the teacher and the learner.

As is so frequently the case, if viewed from a slightly different point-of-view, these opportunities can also be seen as problems. First, the multiple-channel opportunity evokes educational TV's historical inability to produce sufficient quality software to fill the existing, limited channels. Part of the problem here lies in college educators' consistent reluctance to produce material jointly and, more especially, their resistance to using courseware produced outside their own campus.

Second, the opportunity for two-way interaction is clouded by the rather obvious failure to date to identify and perfect teaching methods which capitalize on this capability.

My message, I suppose, is that we educators had better get the horse out in front of the cart – to decide just what it is we want cable to do for our institutions. We have encountered the electronic media before. We've made mistakes. It is hoped that we'll learn this time around, the alternative being Anthony Oettinger's[8] woeful observation:

> Mindful of past fiascoes of educational radio and television, contemptuous of mass media, finding no significant difference, featherbedding, or oblivious, the schooling establishment so far has done little dreaming or thinking about CATV, leaving the field to others.

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# CHAPTER 6

# Cable Television and the University

**by Richard Lyman**

Surely my good friend Henry Chauncey and colleagues who planned this conference must have had their tongues at least partly in their cheeks when they decided to invite to deliver the keynote speech a humanist, an historian converted into a university administrator, a person whose idea of "communications" is a note from his wife reminding him to wear a necktie because there will be 38 people coming for dinner; a man whose grasp of advanced technology reached its peak when, at the age of 15 he assisted in the replacement of a cylinder head gasket on a Model A Ford; an individual who finally got around to watching *Sesame Street after* having rashly accepted the invitation to speak here, thereby spoiling his record of being the only sighted adult left in the United States with no firsthand experience of how it is possible to educate the very young by exposing them to a hairy monster that lives in a trash can.

## SOME UNIVERSITY ATTITUDES

The papers published in this volume have been presented by the experts. They have surveyed the landscape and reported what they found.

others already implied, I shall make no attempt to give a balanced sketch of the current state of play between cable and the universities. Still less shall I try to pose as a seer concerning the future of cable; to ask me to do so would be a bit like asking Alley Oop to prophesy the Apollo moonshots. Rather, I'd like to make a few comments on the attitudes and structures to be found in the kind of university I know best, as they affect, or are likely to affect, the future use of this emerging medium in higher education.

I happen to have spent the last 15 years in what is classified by the taxonomists of higher education as a "major research university." A "research university" is not, of course, one that is wholly devoted to research. Impressions to the contrary notwithstanding, a research university generally does a great deal of teaching, of both undergraduates and graduate students. But the major research universities, even those in the public sector, tend to be selective – often highly so – in the students whom they admit. Those in the private sector charge outlandish prices, which nevertheless don't begin to cover their costs (Those in the public sector have high costs, too, but in their case it isn't so obvious who is paying.)

Both the publicly supported research universities and the private ones are often criticized for paying insufficient attention to "continuing education," that is, to providing educational opportunities for people beyond the classically accepted student-age group, people who very often, for one reason or another, cannot attend the university full-time. The private universities for the most part deserve this criticism. The public ones deserve it less, since most of them in fact do a formidable amount of extension work.

The various strands of the new technology as applied to teaching have, of course, made an appearance in these high-powered universities. Their incidence is very uneven, but I suppose no institution of any magnitude remains totally untouched. The prevailing impression, however, (as I was sure even before some of the panelists presented their views at this conference) is that these universities contain powerful blocs of resistance to new educational technology, and perhaps especially to television, whether cable or broadcast. And that impression is surely correct. For just a few moments, we might consider why this is so.

In a research university, despite all the demands for student participation in running the place, it is, of course, the faculty that holds the key position regarding the acceptance or rejection, use or non-use, of educational technology. And in our institutions, the faculty's enthusiasm for ITV of any kind has generally been muted, often downright inaudible. It is no secret that the attitude of a great many faculty members can be summed up in the immortal words attributed to a member of the

quo just where it is." Why this reluctance?

The most obvious answer—and perhaps when all is said and done the most important—is simply the novelty of the thing. Yes, the novelty, however silly that may sound in this 22nd year of the post-McCluhan Era. Novelty as a medium of instruction, I mean, and specifically as a medium of instruction for *them* to use, with *their* students. There's widespread recognition of its applications in the preschool, primary, and secondary school years. But University faculty suspect instinctively what Messrs. Chu and Schramm found out from examing the existing research on the subject – namely, that ITV has, thus far at least, been more successful at those lower levels than it has in higher education.

There may even be a feeling—conscious or unconscious—among many faculty that one of the tasks of higher education is to wean from the Almighty Tube a student body whose pre-college lives have been spent glued to it. The faculty are unsympathetic with the mentality of the individual who, responding to a Book-of-the-Month Club question "Have you read (a certain book)?", wrote "Not personally." College Professors, taken as a group, are Book People. The Gutenberg Galaxy still provides all that most of them think they need in the way of celestial aids to educational navigation. They read, write, publish, and derive income – both psychic and financial – from the printed word. They understand, even while fretting about and sometimes fighting with, editors. They do *not* understand, and may readily feel threatened by, both instructional specialists and media specialists.

## FEAR OF DISPLACEMENT

Then of course there is the whole question of the fear of displacement. This can take several forms. It may be a *general* fear, a fear of wholesale technological unemployment. We may yet see the academic equivalent of a strike by the musicians' union because some obstinate theater-owner insists on using canned music without hiring a stand-by orchestra to sit around backstage, idle, while the tape is being played.

In the leading universities, I believe that the fear of outright displacement is slight among the faculty, if only because of a widespread confidence in—some might say arrogance about—their own abilities to compete. This could change, however, as more examples of really high quality educational programming, on the college and university level, are produced and become widely known. *Sesame Street* is no threat to, say, a professor of advanced botany, but a threat may soon be forthcoming, in the form of a course on the cable in which the instructor doesn't mumble, the material is up-to-date, and the straight lecturing is agreeably and effectively mixed with film clips, close-ups of lab demonstrations, and

inform the instructor as to whether the students are understanding the material as it's being presented. I've seen something approaching this, though, of course, without the class response, in the broadcast history lectures of the Open University in Britain.

A more indirect concern may be the sense that the coming of cable may tend to threaten the faculty's position of authority within the university. Won't the management requirements of this complex method of instruction tend to push administrators to the fore and wrest control from the faculty members involved? Someone must sort out and try to reconcile the interests and needs of the media experts, the teaching faculty, and a new set of consumers, not to mention a new set of funding arrangements. It is perhaps significant that the Carnegie Commission recommends that: "Institutions of higher education should contribute to the advancement of instructional technology not only by giving favorable consideration to expanding its use, whenever such use is appropriate, *but also by placing responsibility for its introduction and utilization at the highest possible level of academic administration.*[1]

Of course, the Commission was making a good deal of sense. But it is going to be important to give our faculty as much reassurance as possible that in the things that count most for them, such as control of decisions as to course content, and a fair share of any financial benefits to be derived from development of cable, they won't be left out.

There are likely also to be fears lest the coming of cable strike a further blow against institutional autonomy, and in favor of national standardization and regimentation. I've seen instances of knowledgeable people calling in one and the same paragraph for the utmost freedom for the individual entrepreneur and creative genius in cable, on the one hand, and for "some form of national institution that deals with the assessment and distribution of software"[2] on the other. I'm not (at the moment at least) disputing the possibility that some such national center may become necessary. My point is simply that is bound to sound somewhat threatening to anyone who is already concerned about the rapid advance of homogenizing and standardizing tendencies in American education. And that includes many of our faculty; I cannot refrain from adding that I hope it includes many of you.

Fears aside, I suspect a good many of our faculty simply feel that ITV is mostly an approach suited to audiences other than our particular student bodies—to the part-time student, the severely disadvantaged or culturally deprived, the mass market for the less advanced or demanding kinds of post-secondary education.

This is no doubt partly intellectual snobbery. It is as if one said "The image on the box may be good enough for other sorts of students, but *ours* need the real flesh-and-blood scholar in their midst." (Never mind the fact that said scholar may appear as a tiny and almost two-dimensional

puppet in the front of the room, with 98 rows of seats full of your classmates between you and him.)

Yet even the Carnegie Commission, in its survey of instructional technology entitled *The Fourth Revolution*,[2] a book that exhibits marked sympathy for its subject, only forsees between 10 and 20% "of instruction in higher education on campus" as being carried on "through informational technology" by the year 2000, and this (of course) includes a lot of things besides cable or ITV generally. Much as I understand and sympathize with the growth of part-time study and off-campus learning (the fastest-growing sectors of post-secondary education's clientele are part-time students and women,[3] two categories with a lot of overlap) I still see an advantage, particularly for advanced study, in the total immersion of the student in the campus environment of a great university.

## IGNORANCE AND APATHY

I think it would be wrong, however, to view the faculty of the research universities as *rejecting* ITV, out of a combination of fears and objections based on considerations of institutional role. Another element seems to me present—indeed, it may even be dominant. That is an amalgam—a familiar tandem, perhaps—of ignorance and apathy. Most of our faculty simply don't *know* very much or *think* very much about ITV and its potential. Still less have they focused upon cable, and the particular advantages that it will have over broadcast ITV—flexibility, adaptability to specialized audiences, and at least some ability to incorporate student responses.

One cannot entirely blame them. Having already heard me make a fairly full confession of my own ignorance, you may not consider me much of a witness. But after the brief (and I'm afraid often interrupted) cram course that I've undergone in preparation for this occasion, I must say that it doesn't seem that *anyone* is yet in a position to speak with great confidence and precision about the educational potential of cable.

This is *not* intended as a criticism. There are, pretty clearly, a great many imponderables that must be resolved before a clear vision of cable's future can be had. The whole vast question of the economics of cable is one of these. From what sources, and with what incentives, will the financing of cable be forthcoming? Without even beginning to explore the question, let me just state the obvious: The nature of the answer to the financing question that we as a nation finally develop and adopt will affect, perhaps crucially, the future of cable in the universities.

There is also much to be learned, obviously, about the problems of software in Cable ITV. It's a commonplace that we are well advanced on the road to developing the hardware, but that the software—the programs, course materials, and so on is in short supply and of uneven quality. (I

wish I could escape the hardware/software terminology, but one might as well try to desperately oppose split infinitives.)

And that brings us back full circle to faculty ignorance, apathy, and resistance. For the faculties of our great universities should be involved in the effort to develop the software. If they are *not* so involved—if we cannot get them to pay attention to the problem (or, if you prefer, if we can't get them to take up the challenge)—I doubt that the resulting system will be anywhere nearly as good as it could and should be.

In so saying, I certainly do *not* mean that they must *take over* the production of software. When cable has come into its prime, and we are all living in the Great Wired Wonderful World, many of the master teachers whom it will bring into living rooms and classrooms all over the country will have come from *out*side the universities entirely. And much, perhaps most, of what has been accomplished so far has come from institutions other than the major research universities.

There is more than enough challenge to go around, in any case. Consider the task of preparing the number and variety of trained professionals, other than teachers, whose collaboration will be required if instructional television is to be more than just televised instruction; if, in short, full advantage is to be taken of the medium's possibilities. It was talking with one of my colleagues at Stanford recently, an able scholar and administrator, who once, back in the early days, worked on a crew televising professional football. He remarked on how primitive the techniques then were: "About all we did was aim the camera at the guy we *thought* had the ball, and try to follow him." He contrasted this to the considerable sophistication by means of which the television audience is now enabled to follow and appreciate the detail and nuances of the game and as a result, is involved in it emotionally and mentally.

Now clearly the problems of improving ITV software are much more complex. I yield to no one in my appreciation of the truly awe-inspiring complexity which dedication to the goal of making professional football America's number one sport has managed to introduce in what might otherwise have become a mere testing of brute strength. But it's still a simpler and more single-focused affair than ITV can ever be. If ITV is to achieve comparable success with its programming, its producers will have to put together more complicated and more carefully balanced production teams than are needed for sports telecasting. One suspects that integration of university professors in such teams—and deciding the precise extent to which the professor is to have the deciding vote when conflicts arise between technical and academic considerations—will be trickier than the parallel problems in sports telecasting.

There is also the crucial question of measuring the effectiveness of the end result. Measurement of the effects of higher education is a problem very much on a lot of people's minds these days. (Even at Harvard, where

the value of what the institution provides for those fortunate enough to be its students is sometimes thought to be taken rather for granted, a research project is under way, backed by the Federal Fund for the Improvement of Post-secondary Education, entitled "Value Added: Measuring the Impact of College.") In the case of televised instruction, an additional dimension is added to what is already a baffling set of problems. It isn't very satisfying to be told that there is no observable difference between televised instruction and more traditional modes, or even that ITV is better, when we know so little about how to measure either.

At Stanford, we have found that it's not too difficult to interest members of our faculty in playing the role of professor in a televised course—perhaps there's a touch of the lens louse in each of us—but that it's quite another matter to enlist scholars in taking on the tough challenge of evaluating the results. Yet without such evaluation we shall be left to the tender mercies of more or less unguided trial and error. In a time of strained resources in education, a blind man's bluff approach isn't likely to find much favor from the possible funding sources in government and the foundations.

## WHAT RESEARCH UNIVERSITIES CAN CONTRIBUTE

Let me sum up what I believe the major research universities should be able to contribute to the progress of cable in higher education, before offering a few tentative do's and don't's for anyone wishing to persuade the universities, and especially their faculties, to venture into the effort.

The universities can help train the higher-level experts in both the uses of the medium and the evaluation of ITV's results. The latter will be more difficult than the former, but it must be tried. And both would benefit from more explicitly focused efforts. It's great to be able to adopt skills learned for one purpose to the achievement of another—we successfully made computer scholars of converted physicists and mathematicians before the first computer science departments were born. But a little clearer recognition of cable in Education and its skills requirements surely would not hurt.

Beyond that, the universities should provide well-planned and executed research in the problems of cable, including those of its organization, relations with other media, preferred funding alternatives, civil liberties implications, political, sociological, and psychological impact, and so on *ad infinitum*.

Most immediately, however, if ways can be found to free up the necessary resources, such as topflight faculty, without despoiling the rest of our teaching program, we should be constructing our share of the software—the courses for television, or (more likely) the courses that combine TV with other kinds of teaching. (Perhaps 20% of the teaching done in the Open University in Britain is on TV, and when one visits the

place, one is impressed by the extent to which it's a publishing house as much as a TV producer's headquarters.)

Now, assuming that it's important to do so, how is one to lure the universities and their faculties into doing all this?

The first requirement is, of course, money. You would not believe that I'm a real university president if I did not say that. But to discuss the financial problem would require a whole separate speech, and I shall not inflict *that* upon you. Besides, what I'm going to suggest is not the Grand Strategy, but merely some possibly useful hints on tactics.

First, if you're approaching a university administrator, don't tell him/her that your proposal represents only "a modest expansion." He has heard that so often in relation to projects that in fact represent considerable outlays and lasting commitments that you'll simply increase his wariness that way. Indeed, you might wish to consider the opposite approach—a shock tactic like "This represents such a daring leap into the future that only a truly courageous and imaginative president (provost, dean) would consider taking it."

But admittedly that is risky, so you might consider lulling him into a false sense of security by using *all* the clichés he has become accustomed to at once: "a modest expansion," "truly innovative approach," "soundly based on the already recognized strengths of the institution," and so forth. Especially don't forget to throw in "prestigious."

As a fourth—and to me preferred—alternative, you could try telling him/her the *truth*, as accurately as you can forecast it, as to what your proposal will cost and can reasonably hope to achieve. As Mark Twain said long ago, "Always do right. This will gratify some people and astonish the rest."

In approaching the faculty, in most cases I would suggest a careful avoidance of media and computer jargon. Resist catching aphorisms like the well-known definition of the human body as "the most highly-developed, non-linear negative feedback system that can be produced by unskilled labor." Let them learn that kind of thing for themselves; they'll pick it up soon enough.

Instead, look for reassuringly familiar words and phrases, designed to make faculty members think that, if the coming of cable to the campus is to be a revolution, it will be a mild one, one that will still leave largely intact the old, comforting landmarks-classrooms, blue books, library fines, and the rest. A British friend of mine who is a professor at the Open University brought me solace and a sense of security the other day simply by referring to this bright and shiny new institution as "the boring old Open University," for all the world as if he were talking about the most soporific of Oxbridge senior common rooms.

In dealing with *everybody* in the universities, watch out carefully and be prepared in advance for the swirling eddies (and dangerous undertow) of conflicting interests in academe-for example, the frictions between

faculty and administration concerning issues of copyright or who will gain which dollars from a successfully marketed video-taped course. Speaking wholly dispassionately as an administrator, I hope that universities will have the sense to secure at least some of the return from such ventures for the institution and not be content simply to provide overhead, equipment, and heaven knows how many free services to faculty entrepreneurs. (See what I mean by "swirling eddies"?)

I'd also urge you to resist, no matter *how* great the temptation, telling academics that you've found universities to be the most set in their ways and resistant to change of all the species of institutions you've met—too decentralized to make a decision, too many vested interests to make a *progressive* decision, too much academic vanity to make a *sensible* decision. Either the people you'll be dealing with think this already-in which case your comments will be redundant-or they may be insulted.

Finally, don't oversell the product. In a new book by the perceptive French journalism entrepreneur Jean-Louis Servan-Schreiber, there is a delightful anecdote about how Marcel Proust listened to the entire opera *Pélles et Mélisande,* over the subscription service telephone. Predictions were no doubt rife that this would become the normal way of attending the opera; would not the theaters all be dark once this convenience had become generally available? Well, here we are, 72 years and heaven knows how many radio programs, movies, and television productions later, and it hasn't quite happened. The point is not, of course, that the telephone had no future-merely that its future didn't turn out quite the way people thought it would in 1902. Many academics are convinced, and not without reason, that there's very little, ever, that's genuinely new under the sun in education. They're used to encountering the Hawthorne Effect—and to seeing it fade, once the new methods, of whatever kind, have become established and familiar.

All of this I say not to be discouraging, and certainly not to defend some sort of Academic Maginot Line against developments that are full of promise for the improvement of education and the significant broadening of cultural opportunity. There has been a lot of frustration, I know, among those who have come to recognize the great potential of the cable, yet have encountered resistance or apathy in the world of higher learning, and more of it, apparently, the higher you get. Yet every major advance of technology has encountered similar phenomena in the affected community, at least for a time. And nowadays, faced as we constantly are with the mixed blessings that human ingenuity and entrepreneurial zeal have brought us, we may well be less contemptuous of those who resisted than it was fashionable to be in an earlier and more innocent time. It's more important to arrive at our destination than to cut corners. Perhaps we all need to remember the cry of that supreme realist among statesmen, the French Minister Talleyrand, cautioning his coachman: "Not so fast!

Not so fast! We are in a hurry."

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Cable Television and the University

# PART II

# CHAPTER 7

# Potential of Cable Television for Expanding Educational Opportunities via the Predominantly Black College

**by Van S. Allen**

The theme of this panel, *The Market Need for Cable-Based Higher Education,* has particular significance for the predominantly Black colleges of our nation because of two principal factors – the limited resources for expanding traditional educational facilities and the large percentage of Black youth, who, despite all this nation's efforts to assure every citizen an equal educational opportunity, are not able to avail themselves of it because of their limited economic circumstances. Added to those factors is the hard reality that all minority groups who succeed in American society must, sooner or later, come to grips with the fact that success still requires the minority group person to be more competent than his majority group counterpart to gain access to the larger, and more fulfilling opportunities and the decision-making processes of our nation. They must be competent in order to balance the advantages of the majority society's numbers and the in-group strengths that are the result of having been a part of the system and its operations since the landing of the pilgrims at Plymouth Rock in 1620.

The recent turn of events in our nation associated with the energy crisis has served to further emphasize our need to look to new ways and means of meeting all of our needs including those in higher education. This is especially true of the higher education needs of minority group people

of our nation, who are especially interested in how this new and developing technology can be utilized by our colleges to bring the greatest educational benefits to the largest number. An immediate and obvious advantage of this medium is that it allows for the extending of educational and service opportunities by the colleges without the development of traditional educational facilities and resources. For example, instead of reaching a class of 35 or 40 students in a lecture presentation, a professor of sociology may, through cable television, reach thousands without his institution having to add more buildings, professors and/or related resources.

We believe that the Federal Communications Commission should give predominantly Black colleges careful consideration in any matter concerning the use of cable television because of their existing record in educating Blacks in this nation. Although they represent only about 124 institutions out of some 2,700 that offer higher education experiences in this nation, they have produced:

- 85% of the Black doctors in America
- 95% of the Black teachers
- 85% of the Black social workers
- 75% of the Black lawyers

Moreover, even in this time of open institutions in our nation when statistics tell us that one-half of all Black college-going students are in white colleges and universities, it is the predominantly Black colleges that are completing the educational job with Blacks: Those institutions are still graduating upward of 70% of all Blacks receiving college degrees in this nation.

A recent examination of statistics related to morbidity and manpower for the delivering of health services to Black Americans re-emphasized the urgent need to expand the potential of our predominantly Black colleges for producing more health manpower personnel.

The statistics examined showed the following:

- Infant mortality among Blacks is 50% higher than it is among whites.
- Blacks suffer from an outrageously high incidence of hypertension and its attendant disorders, such as, heart failures, apoplexy, kidney malfunction, and so on.
- Black communities of our inner cities have disproportionately higher incidences of drug abuse and crimes of physical violence requiring medical attention.

The magnitude of these problems is further defined by the statistics that show that, when the existing black and white physicians are divided in terms of ethnic groups, the white population has a physician distribution of one to every 700 persons while the black population has only one physician to every 3,800 to 4,000 persons.

Given the above statistics and the fact that physicians, Black and

white, have tended to locate in the more affluent suburbs of our nation, the 50% differential between infant mortality rates of blacks and whites in this nation is understandable.

Cable television has been demonstrated to be an effective means of extending the hands of the physician via clinical and office hook-ups, which allow the physician to remain in his office and, in cooperation with an aide at the clinical site, diagnose and prescribe for patients he (the physician) would otherwise be unable to see in person. Even more important is the potential of cable television for making possible the instruction of larger classes of medical students at all levels of the medical training process. CATV technology will also make possible instant consulting services and inservice training opportunities for physicians in even the most remote of communities.

The history of crime prevention and law enforcement practices in our nation shows that only with the advent of serious thinking and programming to aid the poor did our higher education institutions begin to seriously explore and offer formal training in subjects such as police and community relations, crime and the poor, and so on. Today such institutional involvements are fairly common. However, our law enforcement efforts, especially in the area of education at the community level in which the citizens are reached, leave much to be desired. Statistics show that 65% of crimes occuring in our inner cities with predominantly Black populations are drug-related.

Our predominantly Black colleges located in or near such inner city settings are very much interested in being able to reach out to these communities to:

- help educate the adult community about the drug problem
- aid in developing effective programs of rehabilitation for drug victims and an efficient system for delivering such programs
- educate to prevent drug abuse.

CATV offers unlimited opportunities for these institutions of higher education to begin to deal with this serious problem in ways we have not been able to before. CATV makes it possible to get into homes with messages that are specifically designed to meet the needs of given populations.

For years and years now our penal system has succeeded in doing everything to its inmates but rehabilitate them. This failure has resulted in a terrible waste of human life and talents. To begin to systematically eliminate such practices, Black colleges are seeking ways and means of reaching inside the walls of our first offenders' and other penal institutions to provide educational opportunities for their inhabitants, to assure that their return to society will have an increased probability of success. Cable Television can be the instrument by which these colleges can bring their educational skills and resources to our prison populations, and thereby

assure our incarcerated citizens the opportunity to continue to educate themselves for a more productive life, while at the same time, paying their debt to society.

One of the great and growing wastelands for Black youths of our nation is the inner city. Our current statistics suggest that better than 25% of our largest metropolitan areas are either already predominantly Black or are rapidly becoming so. Moreover, these same statistics show that, compared to the majority while population, a disporportionate number of Black youths of our cities who are finishing high school are not going on to college.

A principal reason for this is the lack of accessibility, which is related to limited economic circumstances and the absence of sensitive and empathic higher education institutions within the inner cities.

CATV can change this accessibility problem by making it possible for Black colleges to reach into our inner cities to bring complete educational opportunities to students who would otherwise continue to be left out of the higher education experience.

The youth in question will have a long wait for the envolvement of traditional higher education facilities and resources in their communities for meeting their educational needs.

CATV offers the most meaningful alternative for short-circuiting the traditional process of making higher educational opportunities available to this segment of our population. Its great value lies in its capacity to eliminate large expenditures for additional buildings and personnel that are a part of our traditional higher education system.

Our Black colleges recognize this potential of CATV for increasing their capacity to serve the nation through the provision of higher educational opportunities to more people, and they are anxious to take advantage of this technology to do so.

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# CHAPTER 8

# The Market Need for Off-Campus Cable-Based Higher Education

**by Jack McBride**

My task in this paper is to address the subject of the market need for cable television-based higher education—from an off-campus point of view and from the special perspective of that which is currently being termed non-traditional study or open learning. Before specifically addressing the market need for this newly evolving educational service, let me first set the stage both in terms of the rapidly developing new service and of a particular project and educational program.

Motivated by the Newman Report and the report of the Carnegie Commission on Non-Traditional Study; spurred on by initial successes of the British Open University; urged further by a currently proclaimed need for accountability, for increased productivity in higher education, for the call to teach more, better, faster and more conveniently; and abetted by a society with a variety of motivations virtually demanding continuing adult education, post-secondary education in this country and abroad is devoting increasing attention to the subject of open learning—to the employment of the latest educational technologies in new and improved manners to make formal education more readily accessable to new audiences conveniently in their homes.

Continuing education beyond the degree is far from new in this country. Colleges and universities have for years provided a variety of

traditional adult and continuing education, correspondence study, and general extension programs. For the most part, these have been conservative, generally successful and limited in the creative use of the available technologies. But with the above-mentioned thrusts, there is rapidly increasing and new-found interest in systemtically employing multiple media to deliver formal education effectively and conveniently off-campus to the student in his own setting and at his own pace. A national open-learning poll we conducted a year ago indicated that over half of the 1,455 U.S. colleges and universities contacted had either non-traditional open learning programs in existence or on the drawing board, and the vast majority of the remaining institutions were appointing study groups to investigate their entry into the field.

## A BROAD SPECTRUM OF NONTRADITIONAL STUDY

By this time, there is a rather broad spectrum of such nontraditional study. It ranges all the way from the use of existing British Open University courses at Rutgers, the University of Maryland, and the University of Houston; to Adelphi College, which combines correspondence study with special use of commuter trains as their delivery system; to San Diego State University, which employs lessons in newspapers as their open-learning delivery mechanism; to a program in Denver which turns neighborhood libraries into open-learning-study centers; to the new Empire State College in New York State; to various consortia developing University Without Walls and Second Chance University programs. The survey indicates that the vast majority employ the media—most particularly, television. Open learning is clearly one of the hottest topics in higher education at this point in time. It gives every indication of continuing so for a number of years. And with technological advances such as in the cable television field, interest in and opportunities for open learning can only be heightened.

The S-U-N project is possibly one of the more significant such open-learning endeavors. Reduced to its essence, S-U-N is three things. First, it is, we believe, the nation's most extensive investigation into opening learning and non-traditional education. Secondly, it is a new exportable model for the systematized design and validation of college-level courseware of superior quality. Third, it is a new model delivery system for American higher education.

With over $880,000 in grants from the U.S. Office of Education, the National Center for Educational Technology and now the National Institute of Education, S-U-N—which is an acronym for State University of Nebraska—has had the funding to assemble the professional staff and devote the time these past 34 months to investigate systematically the subject of nontraditional study and open learning for the adult. As

indicated, colleges and universities throughout the United States were surveyed. Existing and planned open-learning projects in this country and abroad were visited and studied. We have assembled in Lincoln a vast resource library for constant reference by our course development teams.

In addition, extensive surveys were made of the proposed S-U-N clientele. Keep in mind that the target audience for this open-learning project is not the student on an existing college campus. It is rather the adult—from high school senior through senior citizen—who for whatever reason either will not or cannot receive college instruction in the traditional manner. But, before I summarize the findings of our audience surveys, let me complete the description of the S-U-N so that the context for discussion is clearly established.

## A NEW DESIGN FOR HIGHER EDUCATION

S-U-N is a new design for higher education programming. This is the very subject of a concurrent panel, so my comments to this point must be severely restricted. Over the past two and one-half years, we have been fortunate to have had the opportunity to address in depth the design of open learning courseware in a new manner. We have assembled special 18 member course development teams which bring together on a full-time basis content experts, instructional designers, teaching specialists, educational psychologists, professional media producers, writers, directors, cinematographers and the necessary graphic, print, audio and video support personnel. We have developed an elaborate and interwoven twenty-step instructional design process wherein the team, starting with pre-stated course and lesson instructional objectives, assigns specific instructional roles and responsibilities to television, audio and print, designs and produces the instruction, field tests it in a manner similar to the formative evaluation procedures so successfully employed by the Children's Television Workshop, and then proceeds to redesign and reproduce the courseware materials, ending with validated lessons ready for delivery.

In addition to the new higher education courseware design, S-U-N has developed a new open-learning delivery mechanism which employs some Open University elements and adds others. Depending upon local resources available, open learning systems can employ a wide variety of delivery elements. S-U-N has chosen to employ courseware comprised of six elements, or modules as we call them: television—either via broadcast, cable or cassette, audio cassettes, textual materials, syllabi, the newspaper, and instructional kits—together with regional resource centers, correspondence, inward twenty-four-hour WATS lines, and a several day residential requirement upon completion of the course. In the interest of time, I have severely consensed an elaborate and exciting plan which,

according to a variety of federal and foundation subsidizers and evaluators, has the potential to emerge as a major designer and developer for this country of academically substantive and professionally mediated nontraditional open learning college courseware.

But even with such a brief description, it is obvious that engaging successfully in the area of open learning and providing effective instruction can be both a complicated and costly endeavor. Before making a series of important educational curricular, administrative and fiscal decisions, educational institutions must know a great deal about their potential audience. And this brings us right back to our panel topic.

What is the audience potential for open learning? It is sufficient to warrant the considerable commitment required to implement such an educational program? And if enough people are interested, what are their unique interests, needs and abilities? S-U-N was obliged to study these questions in depth. We have by this time generated an elaborate set of statistics dealing with the subject.

Available data can provide only a rough index of the potential clientele for an open-learning system, but such data offer certain maximum parameters. Professor Cyril Houle of the University of Chicago has identified three major clientele sources for external degree programs: high school dropouts–18 million nationwide in 1971 and projected to 20 million in 1990; those with high school diplomas and no college–38 million in 1971 and projected to 58 million in 1990; and those with some college–11 million in 1971 and projected to 22 million in 1990.

These groups are substantial; they will continue to grow.

We have studied these national data in terms of their counterparts in Nebraska and the surrounding region. The Nebraska statistics corroborate that the 21 to 34 age group has the highest participation rate in current adult education programs. Further, the information confirms that the 31 to 52 age group has high potential interest in continuing education. Currently active high school students are another potential source.

In addition to examination of census data, in order to investigate the number of potential enrollees S-U-N has conducted three detailed and independent market studies these past months. They, too, yielded significant information.

A statewide market survey was undertaken in Nebraska by our own staff, using mail questionnaires, telephone calls and personal interviews. Although a number of questions were posed, the survey was designed to focus most specifically upon two: How many people are interested enough in the S-U-N concept to be considered potential students? And what are potential students like?

A second market survey was commissioned to a New York City firm which tested in a number of midwestern states, as well as selected cities elsewhere in the country. Mail questionnaires and a variety of

sophisticated marketing techniques were employed by this professional surveyor. The third study, regional in nature, was undertaken by a professional research company which, in this case, employed the personal interview technique.

From the considerable data assembled, we have learned much about the target audience. The three market surveys corroborate one another. After going through a sophisticated analysis and sifting process which eliminates respondents with only general or varying degrees of interest in such education, the market analyses finally arrived at a figure of 2% of the total adult population sufficiently interested in college credit courses to be willing to use $50 of their hard-earned income for tuition. Let me quantify that for you. Two percent of Nebraska's population would increase existing college enrollments within the state by one-third.

Now, we are not so naive as to automatically regard this as fact. In our long-range fiscal projections, we have therefore halved that figure, then halved it again. The moment of truth will come when courses are actually offered, enrollment solicited and tuition bills paid.

In order to design effective instruction for our target audience, we were obliged to learn a great deal about the age, the educational background, and the ethnic groupings of that audience, its occupational background, its income, its family circumstances, its attitudes and goals, its current activities and interests. In so doing, we identified 15 sub-target population groups and developed elaborate profiles on each. They range, as you might guess, from the high school senior who is eager to get a head start into college or has taken all the subjects his small school curriculum offers to the senior citizen interested not necessarily in credit, but rather in broadening his horizons. In between, there are middle-aged males desiring a career change, middle-aged females seeking enrichment and a college degree, young marrieds desiring to recoup missed educational opportunities, older adults seeking enrichment, physically handicapped persons prevented from attending college in the traditional manner, early retireds thinking of new horizons, students in special training programs such as nurses and technicians, minority and low income persons, college dropouts, job-bound persons, rural and physically isolated persons, and adults seeking personal enrichment.

As I say, we have developed rather detailed profiles on each of these target groups. With additional research currently being completed, we will also soon have available personality profiles on the open learning clientele.

So, as you see, by the time audience projections are drawn there is a significant new population interested in and available for open learning–providing it is academically sound, professionally mediated–which means making it interesting, even entertaining–and conveniently provided.

## THE INTEREST IN ADULT EDUCATION

While most of our audience research efforts have focused upon this two percent of the gross population specifically interested in college courses for credit, our work these past months has revealed a much broader adult audience interested in general education. Surveys show 15 to 20 percent of the gross population interested in some form of continuing or basic education. These findings parallel those reported by a California study in the *Chronicle of Higher Education*[1] and other studies which report one adult in eight now attending some sort of adult education class. This underlines the fact that large numbers of adults are interested in further learning, though they may not necessarily be interested in returning to a formal campus setting.

Clearly, there is an important and substantial educational need to be serviced. When you add to that need the convenience, the capacity and the versatility as inherent in cable television, the potential relationship between the university and the cable television industry become considerable. From the point of view of one post-secondary administrator, I do not see cable television and broadcast television as being necessarily competitive, at least as they relate to higher education. In some ways, they offer parallel services; in some, unique. Obviously, cable offers a far greater quantity of potential service to higher education. Perhaps my views are biased because of the approach we are taking with S-U-N, but we see higher education working extensively with both the broadcast and cable technologies to strive to accomplish this important educational objective.

I mentioned earlier the six modules which comprise the S-U-N open-learning course. Television is a most important one of those. The S-U-N television module is designed for use either by a broadcast station, such as local public television outlet, or for distribution via a cable company. We anticipate that both will be extensively employed and are developing marketing and distribution facilities accordingly.

And this leads to several other concerns. The first deals with courseware. Our study shows that at present very little such programming is currently available—post secondary instructional programming which is academically sound, of sufficient technical quality, and which employs the medium of television in such professional manner as to merit the sustained attention of the intended audience. A professional education television program requires both talented staff, time, expensive facilities, and considerable production budget. The target audience—particularly the one under consideration, the adult in his home—consciously or unconsciously compares the educational television program to its professional commercial counterpart. With the many demands upon the time of this nontraditional adult learner as today's society imposes, only those programs which are creatively conceived and imaginatively produced will

motivate his continued attention. And only in this deliberate and disciplined and systematized manner can educational objectives be met. For there is no real shortcut to learning. The S-U-N plan calls for distinguished academic talents of national repute to join with professional media specialists from both coasts in developing the new courseware.

## THE S-U-N PLAN

Because of both complexity and cost, it may well be that the number of courseware producers will be smaller rather than larger. If so, the quality programming must be made available on the widest possible basis for the least cost. This is the plan of S-U-N. We intend to insure that the courses currently under development and their successors, will be readily available to any educational institution that wishes to employ them. Mediocre materials as produced by over-enthusiastic but well-meaning educators, or entrepreneurs overselling because of false motivations, could so damage the legitimate open-learning potential as to render it ineffective before its fullest service can be realized.

In some circles, the temptation will be to provide watered-down or sugar-coated productions in the interest of expediency. Unless the television and open learning courseware is academically sound and educationally above reproach, more harm than good will again be done. Another major temptation will be that of failure to employ the television medium properly. Instead, the instruction of the classroom will simply be transferred to the television studio where for 30 minutes the talking professorial countenance spews forth knowledge. The result: a dull program which will turn the target audience away in droves.

Though the problems of open learning via cable are numerous and the pitfalls many, the need is ever-present and will increase. There is abundant evidence. The technologies stand readily available to the educator. With their proper employment, the education industry can join with the cable television industry in a legitimate productive and mutually satisfying endeavor to the lasting credit of both.

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# CHAPTER 9

# The Economics of Delivering Education by Television: Some Lessons for Cable Television

by Herbert S. Dordick

## SOME LESSONS FOR CABLE TELEVISION

I shall review four experiences in the use or planned use of telecommunications in education and the lessons that have been learned from them that bear on the application of cable television to education and higher education in particular. These analyses are concerned with the economics of the delivery systems and not with the relative effectiveness of TV learning versus face-to-face learning. The convenient, satisfying and not altogether irrational assumption is made that TV teaching is at least as effective as face-to-face teaching.

## EDUCATIONAL TELEVISION IN COLOMBIA

In the late 60s, over 300,000 primary school children were receiving up to three hours daily of TV instruction in the then-largest program of its kind in the world. Why, then, was the Minister of Education less than enthusiastic about expanding this program? These were two reasons for his hesitancy. First, demands for secondary, university, and adult or literacy programs were growing; and, second, he was aware of but not certain of the additional financial demands that would be made on him if the

primary school program were expanded through the addition of new television technology, thus further reducing resources for these other growing demands.

To determine the costs of using new technology, a study was initiated to examine the economic consequences of achieving two educational objectives for Colombia, objectives that were quantifiable without too many qualifying assumptions and meaningful to the Minister's decision-making needs. The first was to increase the availability of primary education and the second to improve the quality of this education. The first required, simply, to provide more places and teachers for primary children. The second was more difficult to quantify since it was neither feasible nor politic to become involved in an educational performance testing program in Colombia. However, it was believed reasonable to assume that a qualified teacher could provide better instruction than could an unqualified teacher, and in Colombia the requirements for a teacher to become qualified are rigidly defined and their numbers and pay scales are known.

Three planning options were offered: First, a minimal cost one, to maintain the present level of growth and standards – in short, to allow the Minister of Education to keep his head above water. Expansion would occur by continuing planned classroom construction, but with no school reorganization, or additional television facilities, no special teacher-training programs or significantly higher salaries to attract and keep qualified teachers.

The second alternative was to intensify school reorganization through consolidation, increase teacher salaries, implement intensive teacher training programs, but allow no expansion in the use of television technology; in short, a classic or nontechnological approach.

The third option was to expand the number of ETV classes and hours by adding an additional TV channel and training associate teachers, a new brand of semi-qualified teacher skilled in the use of TV in the classroom, perhaps not as effective as the qualified teacher with or without TV but better than the unqualified teachers then in the Colombian primary public schools.

A subset of technological options was also addressed: expanded television via satellite then strongly promoted by the U.S. and some Colombian politicians; the use of airborne television similar to the Midwest Program on Airborne Television Instruction, Inc. program then being used in the United States; and the expansion of the existing broadcast microwave system.

The conclusions: First, to the technological options. The expansion of ETV usage in Colombia required a broader base of coverage and an increase in channel capacity primarily within the most heavily populated areas of the country. The existing broadband microwave network,

operating well enough to bring several channels of commercial television to cities from the Caribbean to the Pacific could be added to and expanded through the use of translators and some cable for less than a fifth the costs of the satellite and associated ground equipment and, furthermore, was avilable immediately. Questions about the realiability and maintenance cost of aircraft distribution systems eliminated the MPATI alternative. In short, it was best to ride piggy-back on existing technology and available services.

Now to the planning options: The incremental investment costs of just getting by and not reaching the desired results during the required six-year planning period was about 75% of the cost of meeting the objectives through expansion of ETV technology and training the new associate teachers. Recurring costs would be about a third higher for this case than for those of the minimal program option. While the incremental investment and the operating costs were about the same for the classic nontechnology option as for the technology-expansion option; the secondary school and university system would very likely be inadequate to train the required number of qualified teachers.

But the significant findings were that the costs of technology did not constitute the major part of the investment required to improve Colombian primary education. Less than 4% of the total investment would be spent over the six-year development period for technology and technology related services (improvements to the microwave netowrk, additional studios, additional technicians, training of the special TV teachers, program production, additional TV sets, their maintenance and repair).

Most of the investment would go into higher teacher salaries, improved and increased classroom facilities, and school administration. In short, the greater part of the investment would have to be spent to create a well-founded and viable educational base that could make good use of the technology.

Two important lessons are to be learned from this experience:

- Piggy-backing on existing technology and services saves money and time and produces a higher return on your investment even if not fashionable.
- It takes a lot of money to support technological habits. In this case, for every dollar spent on technology, about $27 would have to be spent on effectively using that technology.

## THE BAVARIAN TELEKOLLEG

At a meeting of the European Broadcasting Union in Paris in 1966, there were exciting stories of a new and unusual adult extension program via television under way in Munich and throughout the State of Bavaria.

Few reports were received from Bavaria during the next several years, but a steady stream of German visitors to the United States continued to beguile us with great success stories. In 1969, I was invited to visit Munich and found a very unique and complete program in high school equivalency with television playing a significant but by no means major role.

Telekolleg is a formal instructional service of the Bavarian State Radio and Television System programming about two hours per week of instructional programming over a network of transmitters covering the entire State of Bavaria and emanating from Munich. Two hours of new programming and two hours of repeat programming are provided each week just prior to prime commercial time or betewen five and six in the evening. If the student misses a program one evening, he can usually pick it up on the next. The service is aimed at working adults wishing to obtain their high school diploma.

The war left Germany with a shortage of civil servants; many of the returning veterans chose to return to family businesses and farms rather than assume government posts under occupying armies. In an effort to recruit government workers, more than 60 schools were established in Bavaria alone with a potential enrollment of about 10,000. At no time did the actual enrollment exceed 4,000 and the largest graduating class was about 200. Full-time day school was impossible for adults who were rebuilding their homes and families and a four-year schedule was much too long.

With considerable support from the Bavarian Radio and Television authorities and the Volkswagon Foundation, Telekolleg was born. By the end of the third year enrollment throughout the State had reached 40,000, and at the end of the first seven trimesters required for graduation, over 4,000 took the final examination with a 95% rate of success. The examination was identical to that given full-time day students, and the grades in all categories were equal to or higher than those of the full-time day students. However, one must not be too hasty to credit this as proof of the success of televised instruction; students in the Telekolleg were older and more mature, often more highly motivated, and could choose to take the examinations when they felt they were ready. Furthermore, TV plays a relatively minor role in the entire instructional system.

Correspondence, on-campus student teacher meetings, and telephone contact as well as an excellent set of printed materials keep the entire program going. On-campus meetings once every three weeks are required as are frequent homework assignments which are mailed to school centers and returned to the student for comments and, often, requests for a telephone conference follow-up.

A TV audience of between 300,000 and 400,000 is reached by these programs. Enrollment requires the payment of a fee ranging from about $7 for a year of three trimesters or $27 for the entire course to less than $3 a

course for those not taking credit or simply auditing for single credits. Total enrollment hovers near 40,000 with about 10,000 full credit students. All enrolled students, whether for diploma or individual course credit attend meetings and all receive the printed material appropriate to their course of study.

Fourteen months of extensive advertising and promotion preceeded the first televised program in 1966. Government, industry, schools, and the foundations participated and continue to participate in extensive promotional campaigns.

State authorities claim, and my own calculations confirm, that the cost to the state for a graduate of the Telekolleg is about 15% of the cost for graduates of the day schools.

Out of a budget of about $350,000 per year, one-third or about $115,000 is spent for television. This includes script-to-screen costs of the program, actors, and technicians and the special studio equipment not provided by the state radio and TV organizations. Thus, for every dollar spent for technology, three dollars are spent for administration, group meetings, printed materials, the special telephone language drill program, and instructors.

Several important lessons can be learned from the Bavarian Telekolleg:

- The nontraditional learner needs to be sold on education. Only the most dedicated student will seek these programs out on his own. Marketing and advertising are major tasks and require considerable investment.
- Even the most devoted students must be motivated and paced. The loop must be closed and the string to the student periodically pulled. Two-way cable communications with an electronic slap on the wrist for the sleepy scholar is not yet here, but correspondence methods, on-campus examinations, and frequent meetings are excellent substitutes. Student-to-student interaction is probably the most valuable stimulus for the student.
- Once again, the cost of the technology far outweighs the cost of making that technology work; for every dollar spent on television, over $3 is spent for support or as the educators call it, "utilization."
- Piggy-backing on existing facilities and making good use of existing services such as the telephone and mails reduces the cost of delivering education.
- Program costs will rise as the student become more sophisticated television viewers. In Bavaria, the early hourly costs for programming ranged between a low of $100 to a high of $500. As television became more commercial and advertising appeared on the state-operated system, the cost of the instructional programs

rose dramatically. Current costs are approaching $1,000 an hour, and it would not be at all surprising if the black and white TV teacher-with-the-pointer-in-front-of-the-blackboard has been replaced by a multi-colored animated feature. Is it because the students demand it or are the producers competing with their commercial counterparts?

## ALPS – ADULT LEARNING PROGRAM SERVICE

The Adult Learning Program Service was a proposed national project offering multi-media information and education services to adults who have attended but never completed high school. Its sponsor was to be the Corporation for Public Broadcasting, but it died like many other CPB projects during the budgetary battles between the Corporation and the White House. The comprehensive research into target audience, student motivation, program content, community utilization, and costs are, however, of considerable interest to those seeking to use TV for nontraditional studies.

Active support of adult educators, public broadcasters, various national agencies such as unions and industry, universities, colleges, and local school authorities were entlisted. Indeed, capturing the attention and support of the adult education community, wherever it was to be found, was crucial to the success of the project – it was important that this powerful group feel that ALPS would support their work and not compete with them.

ALPS had its genesis in the realization that in 1970 there were 30,000,000 adults in the country who might have taken the General Educational Development tests. Only 331,500 or about 1% actually did and of these one-third failed! Out of this very broad target audience, the most likely students, it was postulated, would be those seeking to complete their high school education for job, family, or personal reasons. A target audience of about 8 million adults between the age of 25 and 44 was selected.

A Harris survey drawn from this target indicated that 84% "wished they had gone further with their education." Of these, about one-quarter were sufficiently dissatisfied with their education to be "very likely" to take courses at home via television. The hard target, at least initially, would then be about 3 million adults!

Some demographics about this audience are of interest: There are more men than women in the target audience – 56% vs. 44%. The majority are white (81%), and the largest percentage – 34%, live in the South. The fewest (15%) are in the West. More than 60% live in metropolitan areas, evenly divided between the central city and the suburbs. Some 62% of the men and women are employed, and 44% earn

between $6,000 and $10,000 per year.

What are their educational objectives? Research found that five could be defined:

- To improve their skills for solving "life's problems" – learning the ropes but not necessarily the techniques.
- To motivate themselves to seek additional skills and better define and achieve their goals.
- To improve reading effectiveness.
- To improve and deepen their understanding of mathematics.
- To continue study, perhaps, beyond the GED.

The program structure, after many months of research and surveys, was planned along the following lines:

- A general-purpose TV series of 35 hour-long programs in magazine format mixing motivational lessons with techniques, information, and practical dramas on solving life's practical problems. *Sesame Street* pointed the way, but there had to be some very specific goal-oriented instruction.
- An inventory of short radio features, none longer than five minutes in length, featuring success stories, and promotional and motivational messages to be used as needed by the local stations.
- A specific-purpose TV series of 30 half-hour units devoted to the traditional skills such as reading, mathematics, science, and civics.
- Local TV and radio programs derived from specific local learning situations and produced locally.

The station manager, on whom much of the success of the program would rest, is called upon to develop local support from community, government, union, and industry. His support could be encouraged by the offer of grants for production and community relations to generate community support. Furthermore, group-learning efforts, such as viewing of programs at local community centers, union and business financing of audio tapes and printed materials, would serve to increase the local peer pressures that motivate the student. Indeed, some sponsors were considering awards and parties for those meeting specified objectives.

It would make little sense to review the details of the budget for a program that died before it could be implemented, but is useful to review the various proposed expenditures as ratios of total costs. Approximately 37% of the entire first year's budget was for TV production including research necessary to design and produce the programs. The remaining two-thirds was for audience research specifically to obtain feedback for future programs, marketing and promotion, and community utilization. Marketing, community utilization and promotion accounted for 30% of the entire budget.

How do the proposed ALPS costs compare with the usual costs for adult education? Taking into account all sorts of qualifying assumptions, it

was estimated that with an enrollment of half-a-million students, ALPS cost per pupil-hour would be about 86 cents and would drop to 31 cents per pupil-hour when the enrollment rose to 1.5 million students. For comparision, elementary-secondary school costs range from 44 cents per pupil-hour to $1.24 per pupil-hour, while adult education costs appear to be in the neighborhood of 60 cents to $1.67 per pupil-hour. In other words, ALPS begins to payoff when the enrollment reaches about 900,000 students!

Several important lessons can be learned from this abortive experience, some new and others reinforcing previous findings:

- The nontraditional adult learner, no matter how well motivated, must be sold on education. His attention is drawn to other matters – family, job, civic and political affairs. He is busy, and learning is an inconvenience. There must be an attractice package for him to buy!
- Rewards are important. Often achieving the necessary credits for a degree is enough. But for many the degree is of less importance. Group or peer pressures are significant motivators, hence a trend towards group learning and group meetings. Job and income rewards would be best and, indeed, the Japanese NHK Gakuen (Secondary Schools) in cooperation with industry offer just that.
- Standard cost ratios once again reappear: A ratio of almost 3 to 1 in favor of nontechnology investment is required to make good use of existing TV, radio, and telephone.
- ALPS proposed to offer access to relevant education to the audience. Just how many would buy was never discovered. Support for ALPS was to come from the Corporation for Public Broadcasting via federal and foundation grants. The payoff to the country would be a better informed electorate. Eventually, business, industry, and the students themselves might be asked to pay for at least a portion of the program. At cost, a student would have to pay about $18.90 for 60-hour course of instruction. What ALPS showed was that it didn't take too many students to make the costs appreciably less than what the federal government was then spending for adult education.

## EDU-CABLE; EDUCATIONAL, TRAINING, AND LEISURE-TIME SERVICES VIA A LEASED CATV CHANNEL

About two years ago, at the request of the OTP, I explored experiments to be performed on pilot CATV projects then being considered. One output was a proposal in the form of a business plan to provide OTP with a data base from which to evaluate Edu-Cable as one of a number of possible services to be offered commercially on cable. The

plan was structured as if it were to be used for an imminent entrepreneurial venture, possibly involving venture capital from the investment community. The intent was to demonstrate, if possible, sufficient economic viability to make Edu-Cable a reasonably attractive business risk requiring little or no stimulation from governmental agencies, especially on an on-going basis. Apart from possible sponsorship, the concept of Edu-Cable is as a privately financed entrepreneurial activity capable of being self-supporting in the commercial marketplace.

I shall describe some of the more salient features of the plan and offer some explanation of why, despite the glowing financial returns apparently possible, it has not been implemented.

The ficticious Edu-Cable Corporation (ECC) will offer adult and postsecondary courses as well as university extension programs over leased CATV channels. ECC will not compete with educational institutions but rather will cooperate and jointly sponsor courses offered by originating and credit awarding institutions.

All revenues to ECC will come from subscriber enrollment in the courses offered, and access to the course will be controlled by the use of a scrambled pay-cable type of channel. Hence, it operates as a per-program pay cable operation.

The plan is considered feasible only for systems with a minimum of 5,000 subscribers, and courses will be offered only if 5% of the subscribers enroll. I shall have more to say about this requirement and the variety of ways by which it can be met.

The initial objective of the plan is to achieve profitable operation on one leased channel within a two-year operating period. This requires:

- Finding suitable sites of sufficient CATV penetration near educational institutions offering adult courses and extension programs and where there is some evidence that those living in the cabled area participate in these programs.
- Finding the kinds of courses that are attractive to subscribers but do not require expensive productions.
- Determining the methods and costs for providing access and for charging for the cable-cast programs. The plan assumes that ECC will charge on a per-program basis utilizing available channel access technology. Terminals would be placed in the homes of all subscribers to permit impulse buying. While costs of the terminals could be shared with the cable operator who is offering other pay services, the plan assumes that ECC will, at worst, have to pay for the terminal and its installation.

An extensive marketing campaign is envisioned, focusing initially on cable subscribers, and then on the passed-by homes. Since the sponsoring institution as well as the cable operator stands to gain from the success of Edu-Cable, the former from percentages of the fees charged for the courses

and the larger the enrollment they can expect, and the latter from the possibility that new subscribers to cable will appear in order to avail themselves of the courses offered, the cost of this campaign could be shared.

A key factor in the marketing plan is to place channel access equipment in every home, thus encouraging the subscriber to use the equipment. The cost and maintenance of such equipment can be high. While the plan assumes that ECC will do just that, it is a bit unrealistic. More realistic would be to charge each subscriber who wants a box a deposit returnable upon relinquishing the converter, or, using the Book-of-the-Month-Club approach, requiring the subscriber to purchase a certain number of course-hours in his first subscription year.

An alternative to a per-program charge is a modest monthly fee for access to courses via the supplied channel access equipment. It is of little concern, then, whether or not the subscriber purchases a specific course. The monthly charges must, of course, be high enough to defray the cost of the offerings but not too high to discourage monthly payments. In the cost/revenue projections to follow this cost turns out to be $6.25 per month.

To be competitive with on-campus tuition, charges of $1/hour for noncredit courses and $2.00 for credit courses are to be charged. Assuming 50% enrollment for each, the average cost per course-hour is $1.50. Revenue estimates are arrived at on the basis of billable hours. To arrive at a reasonable method of computing billable hours 100% utilization is defined as 20 hours of course-programming, paid for by at least 5% of the subscribers. Thus, for a system of 5,000 subscribers, if 250 subscribers enroll for 20 hours of courses per week the weekly billable hours are 5,000 and at an average revenue of $1,50 per hour, the weekly revenue would be $7,500. Alternatively, 5,000 subscriber-hours could be obtained by fewer subscribers paying for more hours of viewing. If each subscriber purchased one course-hour at $1.50, this would amount to $6.25 per subscriber per month.

If every home in the 5,000 subscriber area agreed to lease a converter for viewing educational, cultural, instructional programs at a monthly rate of $6.25, maximum revenue of $375,000 per year with which to develop programs would be avilable. The cost of billing and the monitoring of billable hours could be, effectively, eliminated. In short, once the subscriber pays $6.25 (or $75 for a year's programming) what courses he takes or when need not be of much immediate concern. The long-term concern would be to make good use of the revenue for programming so that the subscriber renews for the following year.

For systems with 10,000 subscribers, the maximum yearly revenue would amount to $750,000 and for systems with 20,000 subscribers, $1,500,000!!

Five major cost categories were considered in this business plan.

*Channel Leasing* – The maximum cost is assumed to be no more than 1/20 of the normal subscriber income from a twenty-channel system. No variable rate card for special hours, days, or services was assumed rather unrealistically. For the 5,000-subscriber system, the yearly lease cost is assumed to be $15,000; for the 10,000-subscriber system, $30,000, and for the 20,000-subscriber system, $60,000.

The hourly lease cost is $15, $30 and $60 respectively for 100% utilization. Clearly if the use rate falls to, say, 50%, the hourly rate charges effectively double.

Cable operators may ask for a percent of the gross revenue rather than a set yearly lease rate. On the other hand, considering the risky nature of this business, he may demand the fixed rate up front.

*Program Production and Copyright* – These costs are most uncertain. Several levels of production were assumed – for start up, simple black-white filming of the in-class lecture at a cost of about $500/hour, but eventually rising to over $5,000 per hour for more elaborate productions. In all cases, these costs were amortized over four showings, after which it was assumed new productions would be required.

If the production costs were borne by the sponsoring institution, ECC would pay the institution 50% of the gross subscriber receipts for the use of the material. If, on the other hand, ECC assumes the entire cost of production, the sponsoring institution which would still have to lend credibility to the course and provide the necessary support in the form of correspondence, examinations, and registration, and so on, and would receive 25% of the gross subscriber revenues.

With the courses ranging from eight to sixty hours, the program costs could be anywhere from a very low one of $4,000 to a very high one of well over $300,000. Even at that, these appear now to be gross underestimates. While amortization over a longer period of time – more showings of the same course on many other systems throughout the country – could make the books look good, the up-front expenditure is still extremely high. And the show could be a flop!

*Capital Facilities and Operating Costs* – These costs ranged from $24 per hour to $84 per hour depending on whether ECC simply played tapes provided by the institution, provided a mobile color taping facility, or managed the entire production in its own facilities.

*Support Costs* – These are general operating overhead costs to be assumed by the ECC and set at 120% of operating costs.

*Access Equipment* – Several uncertainties exist in attempting to define these costs. Nevertheless, we assumed that devices could be purchased for about $50 each, in fairly large quantities. Further, a worst-case assumption is made that ECC would bear the entire cost of purchasing and installing these devices, a rather startling suggestion since

the cable operator could use the same device for his own programming.

Does ECC make money and when?

For the small 5,000 subscriber system, ECC cannot produce the programs: The sponsoring institution does it all and receives 50% of the gross in royalty payments. In the case of the larger system, there can be a choice of who does program production. This is included in the following financial summary (Figure 1, page 86).

If this is so attractive a business opportunity, why is it not now being implemented? There are many reasons and these are some further lessons to be learned:

- While most surveys of potential cable subscribers almost always show a strong demand for educational programs, the demand rarely, if ever, materializes. Despite the attractive Return on Investment of the various market options, the maximum negative cash flow or investor's exposure is high, and venture capital is difficult to obtain. The cost of money is too high for the risks. In short, the market is unknown, untried, and characteristically unstable. Education has never been known to make money; education costs money!
- Cable operators are frequently loath to lease channels to doubtful projects. The greater the doubt, the greater their desire for up-front payment rather than a percentage of gross revenues, thus increasing the investor's cash exposure. Furthermore, many systems in university and college towns where the market may be favorable do not have sufficient channel capacity to lease for doubtful ventures.
- By far the greatest unknown is the cost of producing suitable educational material. Programming risks for projects such as ECC are no different for educators as they are for motion picture producers – all the money is up front and a flop is a disaster. It may be, however, that of all the high-risk costs, program production is one that might be financed by federal grants. Instructional software grants are not unknown and a disastrous sixteen-hour physics or arts course might be turned into fifteen-minute or half-hour instructional film strips for class room use, thus salvaging at least part of the initial investment.

## CONCLUSIONS

Doubtless there are some fundamental truths buried in these experiences, truths that can be of significant value to the application of television technology to education and specifically of cable television to higher education. In this relatively short paper, it has not been possible to explore in great detail the variety of economic experiences these four

*Financial Summary of Operation of One Edu-Cable Channel**

| | Start-up operation | | | | Steady-state operation | | |
|---|---|---|---|---|---|---|---|
| Mode of operation | Profitable Operations | Cumulative break-even point | Max-neg. cash flow | Cash flow crossover point | Annual revenues | Pre-tax profit | Return on investment |
| 20,000-sbuscriber CATV system; EEC does not program production | 9 mo. | 20 mo. | $370,000 | 24 mo. | $1,500,000 | $382,000 | 35% |
| 20,000-subscriber CATV system; EEC does all program production | 13 mo. | 23 mo. | $540,000 | 28 mo. | $1,500,000 | $434,000 | 37% |
| 5,000-subscriber CATV system; EEC does not program production | 14 mo. | 32 mo. | $136,000 | 45 mo. | $ 375,000 | $ 52,000 | 12% |

* From *Aspen Notebook Cable and Continuing Education*, Adler and Baer, Praeger Publishers, 111 Fourth Avenue, New York, N.Y. 10033, 1973. p. 125

Fig. 1

programs have illuminated. However, these are some very clear insights one can gain from these experiences insights which may be of significant value to those planning to use cable for education.

(1) The Market and Marketing: The Education market is an uncertain one subject to trendy fashion. Popular courses this semester draw few students the next. It is unclear why. In the face of the high product cost, its life is extremely important and if the product cannot be used over several years and beyond the boundaries of the originating institution and its neighboring communities, it is uncertain if an investor would be willing to place his money in this market. It is also uncertain if a university would wish to invest its limited resources unless it was very clear that there were other savings and other benefits to be achieved.

In any case, the marketers of such programs must recognize that despite subscriber surveys which rank education high, there is little evidence that those same respondents, when faced with a choice of paying for an educational program or viewing free TV, will choose the education program. In short, education is difficult to market, and there is very little experience in the kind of promotional efforts required to do so. We have but to look at the recent records of proprietary schools who have had the longest experience with marketing education to see how difficult it is for them to survive the vicissitudes and uncertainties of the educational market. In any case, selling education requires a continuing marketing and promotional effort whose costs are high.

Credibility is an extremely important factor in the sale of education, and yet all too frequently when the educator sells he looses credibility. For this reason it may sometimes be better for educators to leave the selling to national and community organizations that are the client's peers. Thus, a sort of peer presure can develop which will not only help sell the educational program but may also reduce dropouts. Dropouts cost a great deal of money, and again a glance at the experiences of the proprietary schools will show to what extent they suffer when dropouts increase above some predicted number.

Selling education via television on a per-course or per-program basis compounds the sales difficulties. For many adults, education is fashionable, perhaps desirable, often necessary but almost always inconvenient. The mechanics of purchasing a course or program may lose the student. For this reason it may be more desirable to market access to a wide range of educational experiences including courses. In effect, the subscriber is offered access to the cultural, artistic, humanistic outputs of the university and college, for which he pays a monthly or yearly subscription fee. Once having made this sale, the institution need not concern itself with just when and how the viewer utilizes the channel-access equipment. The university and the cable operator must concentrate on providing a variety of offerings that will attract the

subscriber to renew his subscription.

(2) Cable Communications and Integrated Communications Technology: Cable must be considered as an additional carrier of communications services available to the educational institutions. It makes little sense to consider cable as something new and separate from existing microwave and telephone resources. Offering educational programs via the cable without utilizing the available resources of telephone and microwave facilities, or for that matter the mails and the campus, is wasteful. The educator must piggy-back existing system capabilities, recognizing that if feedback is necessary, there is no need to wait for expensive two-way cable technology but rather utilize telephone, the mails and the periodic on-campus visits. To the entrepreneur who wishes to offer educational services via communications, the return on his investment can be large if he recognizes that his investment includes all of the prior investments of AT&T, the broadcasters, and the U.S. Postal Service. His delivery system will not be a pure one but it will work and furthermore can be quickly implemented.

(3) Costs: Cable technology will not be the major consumer of dollars for the delivery of education. Experience has clearly shown that technology itself is a relatively small consumer of resources but rather, that it generates the need for extensive investments in services that will make good use of the technology. One should expect that for every dollar of technology (one-way or two-way television, channel-access equipment, studio facilities and tapes, and so on.) between $3 and $6 will be spent on support services to make it work. These will include: processing student applications and student papers through the mails, arrangements with the telephone company for student/teacher conferences, periodic on-campus visits between students and teachers and between students, books, papers and other printed material.

It may indeed be true that educational communications could reduce the need for new capital construction but it will certainly increase the need for operating dollars. Which is easier to come by? Unfortunately the ediface complex on the part of most alumini makes it easier to provide new facilities rather than new services.

(4) Risk Taking and Partnerships: The cable operator is not known for taking risks, certainly not today. The cable operator knows all the trite phrases about how uneconomic educational broadcasting is. He looks with considerable suspicion at schools and universities that not very long ago wanted 20% of his channels gratis for educational purposes, knowing full well that much of their allotted over-the-air time was inadequately used. Today more than ever the cable industry is prepared to fight any city's demands for free channels or free-access time. Many of them believe that one channel for educational access is more than the educators can haldle well. Experience to date with this channel has indeed shown little or no

utilization, but the reasons are not that the educators do not know how to use the channel but rather that this channel offers them nothing more than the educational broadcasting station channel that is already available to them. Indeed, with cable penetration generally less than 50%, the over-the-air channel is much more useful than a limited-coverage cable. The educators need special private-access channels that can interconnect clusters of schools for special instructional purposes, communications facilities for data processing and for computer-assisted instruction. And they must be willing to pay for them. Indeed, many are now already paying for specialized communications channels, either in the form of constructing and running thier own ITFS systems, wiring their own campuses, or leasing lines from the telephone company. In particular, the money now being spent by educators for leasing lines represents displaceable dollars that can be used to purchase more flexible and perhaps less costly cable channels.

The future of cable and education rests on the degree to which the risks for entering this new field can be shared by both the educator and the cable operator. The federal government might be counted on to provide seed money, especially for program production, but the educators will have to provide the nontelevision services in order to make the instruction credible and valuable. Cable operators can provide and maintain the cable channel and the necessary services to make the channel access system work, but they must be assured that the educators will share the operating and financing responsibilities and risks.

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# CHAPTER 10

# The Present and Future of Televised Education at Brigham Young University

**by Darrel J. Monson**

Brigham Young University's dedication to the use of media technology is broadly based. We have more than 200 full-time people employed in the activities of instructional design and production. (This does not include 110 people involved in media distribution and library personnel.) We have extensive commitments to most of the media, including a department of Motion Picture Production and an Institute for Computer Uses in Education which conducts research in computer-assisted instruction and computer-managed instruction. We have a department of Instructional Television Services that produces instructional television products and a Broadcast Services department that operates KBYU-TV/FM, the University's FM station.

Brigham Young University is located in a metropolitan area of about 100,000 people and has 25,000 students on campus, most of whom are not area residents. We have an extensive commitment to undergraduate education and are currently doing a major revision of our general education requirements in which most of the coursework that emerges will be instructionally designed using a wide variety of media.

## CHANGES AND TRENDS IN INSTRUCTIONAL TELEVISION

There has been a marked change in the type of instructional television product produced at BYU over the past few years. For example, there has been a dramatic shift away from full-course instruction via television to modules. Moreover, there is a trend toward the use of television instruction as a part of well-designed instructional systems. There is a dramatic growth in the use of individualized instruction which allows the student to work at his own pace. This has resulted from the use of hybrid cable/learning resource center systems and individual cassette carrels.

There has been a great improvement in the instructional quality of ITV products at BYU over the past few years. The use of instructional-analysis procedures has resulted in new ways of breaking down content into elements which are more easy to work with. Four basic procedures have resulted.

- *Content Analysis*–analyzing the content structure of the material to be presented and formulating that content in a more meaningful configuration for the student to handle.
- *Presentation Analysis*–structuring the content in a presentation form which will have greater initial impact on the student. Using the strengths of the medium to aid the student in mastering the content.
- *Implementation Strategy*–providing a procedure which will aid the instructor to more effectively integrate the package with other learning activities. Providing evaluation procedures for the instructor after using the package to determine whether the student has accomplished his or her goals.
- *Evaluation*–developing procedures which will allow total evaluation of the package from the standpoint of instructional evaluation, validation of the package, and evaluation of the instructional design.

Evaluation results of this procedure have shown that so far there have been gains of as much as 48 per cent in student test results using systematized procedures of instructional analysis and implementation. A televised pre-calculus mathematics class has had a mean score rise of 42.7 per cent on criterion referenced tests. In some pre-test/post-test procedures, there has been a rise of between 90 and 100 per cent in correct student response when measuring cognitive skills and retention.

There is a growing divergence between our activities in public television and instructional television. Production equipment is different. Personnel in instructional television are more oriented toward instructional psychology although they are highly qualified in techniques of visual and audio production. Courseware for instructional television is designed for change, usually to accomplish a specific instructional task, and is aimed at

particular student types. It is carefully evaluated both in the pre-packaging phase and the post-packaging phase.

Within the next decade, there will be a broadening of distribution systems for instructional and industrial training products. There will be a tremendous increase in the use of individualized playback systems for students. Videocassette systems will expand, and videodisc will become a viable instructional tool. Individual access to video information through computer-managed instructional television systems will develop, using all types of distribution systems including videodisc, cable, and open circuit transmission. TICCIT (Time-shared Interactive Computer Controlled Information Television) and similar systems will grow.

There will be a growing interest in the use of the cabled city to provide instructional television services individually and in groups. Open-university systems using basically video systems for the content information and instructionally designed course formats will continue to grow. Interactive systems will continue to offer a wide selection of materials. There will be about the same amount of open-circuit instructional material, but it will be of higher quality with more instructional impact because we now know more about systematizing instructional procedures and using television not as the only means of instruction but as part of the total instructional package.

## MARKET NEEDS – PRESENT ACTIVITY

The market needs for cable-based higher education in our area are similar in many ways and different in some to many larger, as well as equal-sized, communities throughout the United States. We are expending our efforts to fulfill our educational obligations to at least eight groups. We are currently meeting or planning to meet those obligations by a number of methods. The groups and the methods are shown on the attached chart. The notations in the body of the chart are represented as follows: "X"–in operation; "D"–under development; "T"–under testing; "P"–in the planning process. In the left column of this chart are systems that may be further identified as follows:

1. KBYU-TV, Channel 11, includes repeaters throughout the state of Utah, plus a number of CATV systems in four states.
2. A closed-circuit twelve-channel cable system serves all major campus buildings and on-campus residences.
3. A system of Learning Resource Centers exists on the campus. The main center is in the library. Others are located in eight other campus buildings plus ten residence halls.
4. A two-way microwave system is in operation between the BYU campus and several locations in Salt Lake City (45 miles away). This allows closed-circuit video transmission with either video or audio

feedback.

5. Video cassette players for individual use are available in many campus locations.
6. Video tapes are bicycled to many locations throughout the United States and other parts of the world.
7. A cable tie exists between the campus cable system and the CATV system which serves Utah County (in which the university is located).
8. We are collaborating with the MITRE Corporation of Washington, D.C. in a CAI system called TICCIT.
9. Under development is a freshman curriculum program that will allow students at 20 U.S. locations to take their freshman year in their home town. These programs will be administered in church buildings.
10. A funding program is now being undertaken to establish a microwave system throughout the states of Utah and Idaho which will reach to a total of five college campuses, 11 church-sponsored hospitals, plus five continuing education centers.

## SOME FUTURE POSSIBILITIES

We are excited at Brigham Young University about the advent of cable television in our community. The city of Provo is now being wired and will go on the air within the next few months. The city of Orem adjacent to Provo is to be cabled by fall. With the advent of the cable, we anticipate programming more of our course material, both for regular instruction and for continuing education. Brigham Young University has been held at a ceiling of 25,000 students for five years. We have great pressures on us to expand the number of students served. Programming on cable television, both in conventional television format and in frame-grabbing format, offers the possibility of being able to take care of many additional students without materially increasing our on-campus physical plant.

Our student body, which comes from 50 states and over 70 foreign countries, has a wide divergence of educational backgrounds and cultures, and our educational program must take this into consideration. We believe that conventional television instruction, even though it may have some individualized feedback capabilities, does not solve our problem. We are, therefore, actively involved in our TICCIT project, anticipating that this mode of individualized instruction will be of considerable help to us. A combination of mini-computers and conventional television systems connected by cable can be of material benefit. We are currently involved in the preparation of four courses, two in basic mathematics and two in basic English, that will be tested this year at Brigham Young University and starting this fall at two junior colleges in the United States. By extension, it makes possible individualized instruction over one cable channel to approximately 1,000 students. Details of the TICCIT concept are described in an article that first appeared in *Science* magazine, June 9,

## BRIGHAM YOUNG UNIVERSITY VIDEO EDUCATION PROGRAMS

| | Student Body | American Indian Program | Industry and Business | Adult Community | Public School | Worldwide Church Ldshp Training | Other Student Bodies | Continuing Education |
|---|---|---|---|---|---|---|---|---|
| KBYU-TV + CATV | X | X | X | X | X | X | X | X |
| Campus Cable | X | X | | X | | X | | X |
| Learning C Centers | X | X | | X | | X | | X |
| Microwave Salt Lake | | | X | X | | X | X | X |
| Video Cassette | X | X | | | | X | | |
| Bicycling Tapes | | X | X | X | | X | X | X |
| County CATV | X | X | X | X | X | X | X | X |
| Frame Grabbing | D & T | D | P | P | D | P | (T) | P |
| 20 U. S. Locations | | D | | D | | D | D | |
| Microwave Network | | P | P | P | | P | P | P |

972, entitled "Plato and Ticcit: CAI in Action." This was reprinted in the

ctober 1972 issue of *College and University Business*.

We are also very interested in using frame-grabbing principle in pplying a community information service and continuing education rograms utilizing cable. We have drafted a tentative proposal for which e will be soon seeking funds to show how this method can be applied to community generally.

# CHAPTER 11

# The Market Need for Cable-Based Higher Education

**Ronald D. Clark**

I feel that my appearance on this panel was brought about because the work of my association for nearly 50 years, and my own work for the past 20, have dealt with so-called nontraditional education. Further, I suspect that the audience for a remote education mode may, in the case of TV students, quite nearly resemble the case of correspondence school students. If this is truly the case, then some of the market phenomena for cable-based education will in all probability bear resemblance to those in private correspondence education.

Public dissatisfaction, videotape cassettes, vocal critics, computer terminals, rising costs, educational television, teacher strikes, independent study, and disgruntled students have one thing in common. They are resulting in experiments about "education without walls." Very often, such efforts begin as an alternative method for individuals who find conventional schools repressive, oppressive, and insensitive to what they want to learn, or inaccessible because of distance, scheduling, or the cost/space syndrome.

Some of these experimental junkets have shown promising results, so now the daring educators (such as you who are here) encouraged, admittedly, by the commercial pushers of TV and cable systems, are trying to view the TV educational systems, and more particularly cable TV

systems, in an objective way; trying to see how this marvelous medium can be applied to the improvement of higher education.

Well, to make cable TV work, if indeed it will, we have to take a hard look at the market, and as we look at the market, I hope you'll forgive me for also mentioning the marketing.

Let me make three points which will probably raise three to the tenth questions. We should examine audience profile, then look at the problem and challenge. Finally, this is going to require money; we'll have to pay the bill.

## I. AUDIENCE PROFILES

From what we know about a potential audience, plus rudimentary surveys made by public and proprietary researchers, we have made a few generalizations about a profile of these students we are seeking. We think:

- 75 percent will be men.
- Most will be in the 23-32 age bracket.
- Half will be seeking credentials or certification.
- 25 percent will be trying to learn, so they can advance through improved performance.
- 25 percent will study for the sake of study. (You may not hear too much from them; therefore, they will adversely affect your statistics.)
- Most will be married.
- Most will hold jobs which they cannot afford to give up, and will have to schedule their learning activities around their employment.
- These students are going to be critical. They are going to demand "relevance," whatever that is. It's up to us to find out what is relevant because these same students are going to hold us *accountable*, and they are going to set the standards for success.

## II. PROBLEM AND CHALLENGE

I'd like to move on the problem and challenge which we face. The biggest one is motivation. It does certainly appear that there is a market. We have to find the customers. Then we enroll them. Then we want them to proceed with and complete their courses. This requires motivation.

Thus, motivation is a continuing element of marketing because the end product is successful completion of the chosen course.

Not much motivation is required to get the students to watch the tube. They are used to this. But educational TV is going to have to be good – good enough to motivate the viewer not to change to another channel.

We think the students will be goal-oriented. This means we'll have to find out their goals, and not merely try to superimpose ours on them. It means that throughout the various courses the programmers must make sure that the goals are clear, and that the steps toward them are purposeful.

For a long time we have held out a degree as a goal. Maybe it will continue to be thus. But our young people are beginning to ask, "What can I do?" or "What can you do?" not "What does your diploma say?" Employers, too, are not quite so uptight about hiring degree holders who exhibit little else.

Maybe one of our challenges should be to stop confusing ability with paper credentials. All of this is a part of motivation. Think about it.

## III. FIANANCES

Education is expensive. Someone has to pay for it. Of course, I look at this from the viewpoint of the proprietary school sector. I think the student should pay for it. Even in the public tax-supported institutions, the student ought to bear a share of the costs. I am not all sure how this may be accomplished. I do suggest a few points which might be pertinent:

- I have already said that each course has to be relevant, and the student goals clear and his goals.
- The course offerings must be measurable – in course credit or in some other desired way.
- Course results must be clear to the student – so he can answer his own question, "What am I going to get out of this?"
- The school is going to have to require feedback from the student–feedback that can be evaluated – so that the school can certify that the student has attained something.

By this time it's obvious to you, I'm sure, that I don't know any of the answers, and not even many of the questions. But each of these factors – audience identification, problem, challenge, and finance – is so important that some answers will have to be figured out, preferably before we spend an inordinate amount of money on getting a system started the wrong way.

Finally, I'm reminded of the ancient Greek philosopher who didn't say: "Give me a damn fool and a fulcrum, and I can move the world."

The world is full of damn fools. Maybe, just maybe, Educational TV is the fulcrum.

Cable Television and the University

# PART III

99/100

# CHAPTER 12

# Let's Use CATV For Results - Not Style

**by Preston Davis**

The average American television viewer is accustomed to the availability of dozens of entertainment and informational shows each day, many of which cost more than the total yearly television budget of many universities. Television is also employed as a worldwide tool to instruct, inform, conduct research, and even to locate breaks in pipelines.

Cable television can emerge as a major education resource. If we are to use this tool effectively, we must learn from past mistakes that have resulted in disappointing use of new technology in higher education throughout the nation. In my opinion, one such mistake would be to adopt the philosophy that we must compete on an even footing with the commercial television stations. While many efforts need to be handled as professionally polished studio productions, university personnel -- including the TV folk -- need to approach CATV as a viable communications system that can be effectively used on a routine and spontaneous basis.

Since 1965, faculty at Colorado State University have used video-tape as the basic television vehicle. Recordings are used to illustrate proper procedures to students for more than 250 courses to improve the quality and availability of instruction. Television has become a broadly used tool

on the campus, but this is only the start of an expanding use of technology.

In 1967, a group of key university leaders developed plans to use videotaped instruction at the graduate level:

- to extend educational opportunity across Colorado
- to provide academic programs at a persons place of work
- to allow more professionals to work on advanced degrees
- to provide coursework for fully employed, tax-producing citizens
- to allow for company business and travel while not missing coursework

*Colorado SURGE* (*S*tate *U*niversity *R*esources in *G*raduate *E*ducation) was developed to extend regular classroom coursework to the 34 industrial and governmental organizations now participating in Colorado and other states. The program is currently centered in the Colleges of Engineering and Business.

Courses in this graduate program with regular classes which are taught on the campus whether television is employed or not. The classrooms are equipped with cameras, microphones, and other apparatus to capture in a spontaneous way the entire classroom presentation with questions and answers between the students and the professor. At present, four such classrooms are used to handle well over 100 courses each year.

In SURGE control – remotely located from the classrooms-the signals are monitored, and technicians control the movement of the cameras. All copies of courses are recorded in the quantity needed for the remote locations. Tapes are made on ½", 1" and ¾" cassette equipment. The tapes are packaged, and along with handout materials, are transported daily to the program participants. Employees in the plants are enrolled as regular graduate students of CSU. They view the tapes and participate in all assignments and activities expected by the professor.

Gale Hamelwright, Personnel Department of the Hewlett-Packard Company, Loveland Division, had this to say about his company's experience with SURGE:

> We are extremely interested in the growth and development of all of our personnel. The SURGE program is of tremendous assistance in helping to meet our training goals, while at the same time avoiding the need for us or other industrial firms to be located on the doorstep of a major university. Our employees are encouraged to participate and they perform all the regular classroom homework, assignments, examinations, theses and special projects as the on-campus students.
>
> They can contact the professors during working hours by phone, and the professors make every attempt to visit the plants. Our employees are allowed to use our computer for class assignments, and the videotapes may be retained and seen later by those on company business or travel. We consider this as a two-way program which

closely unites industry-university relations.

*CO-TIE* (*Co*operation Via *T*evised *I*nstruction in *E*ducation) is a cooperative program for undergraduates between CSU and the two-year institutions in Colorado. Many of the videotapes are made using the same in-classroom techniques as SURGE while others are produced in the color studios. In addition to videotaped instruction, CO-TIE employs dedicated telephone lines to allow recitation sessions and conference phone calls among the participants.

This program is also a model for resource sharing of computer capability. Nine two-year colleges in Colorado have terminals that are tied to CSU through dedicated phone lines of Mountain Bell and the state-owned microwave system. This provides direct access to the two-million CSU computer center, overcoming the severely limited computer capability of the smaller institutions.

*HI-TIE* (*Hi*gh School Cooperation via *T*elevised *I*nstruction in *E*ducation) is another extension of regular university classes, in this case to high school seniors have completed most of their coursework and who take university credit coursework by videotape.

Our newest effort in resource sharing is Bio CO-TIE (*Bio*logy *Co*re via *T*evised *I*nstruction and *E*xperimentation), a consortium of 13 two-year institutions in the state, on the sophomore year in biology. This is a total support system consisting of notes, videotapes, slides, graphic materials, and suggested examinations along with auto-tutorial booths and laboratory support for each of the institutions. The videotapes are made in the CSU color studios where much effort goes into each session. The tapes are highly illustrative and are usually less than 20 minutes in length. All the materials are carefully evaluated – both before they are produced and when they are used with students at various institutions. A national evaluation team, selected by the American Institute of Biological Sciences, was engaged at the start of the project. The evidence to date clearly indicates that Colorado institutions of higher education can achieve many things together that they cannot do alone.

It has been very exciting to participate in these videotaped programs, for which we greatly appreciate the support of the National Science Foundation. As we look forward to the use of cable television as an emerging educational resource we expect to be guided by a number of principles that have worked at Colorado State University. First and foremost we subscribe to the philosophy that there are *no* hardware problems, only people problems. After all it is people:

- who decide to use or not to use television
- for whom media is prepared
- who approve or do not approve budgets
- who design systems and fix cameras.

In concert with this philosophy, we feel that FACULTY

WILLINGNESS AND READINESS to innovate is the key ingredient to the adoption of new technology in higher education. All other factors are secondary.

Following are some of our views on this most important ingredient:

*Original type programs* Like most universities, CSU has several thousand course offerings and a multitude of programs. Television efforts serve widely different audiences having different numbers and goals. It would be nice to think that every television effort could release faculty from other responsibilities for more than a year and involve budgets reaching $10,000 to $20,000 per hour of production. But this is unrealistic, especially in an era when expenses are being curtailed.

If cable television is to have serious impact in higher education, faculty must have a choice of different programs, ranging from the "ultra-slick" to the extension of the regular classroom. No single type will do all jobs, and choices must be made by the academician rather than the television producer. We feel that cable television lends itself nicely to this optional approach.

*Leadership* Faculty at CSU have about the same degree of autonomy as faculty at any other university. When there is strong leadership from deans and heads of departments in setting media objectives, faculty are quick to respond. On the other hand, where that leadership is absent, innovation with media can only be spotty. We are extremely proud of our faculty in developing innovative approaches to educational problems. We have observed that they work hard for the objectives and needs of their department.

Attention also needs to be directed to such well-meaning but otherwise devastating internal staff actions as:

- Organizing innovative efforts under people who are more interested in regulating such programs than in building them
- Classifying off-campus courses with special numbers denoting "second class" status for both students and faculty
- Continually searching for and singling out faults in new programs, even though problems are expected with new efforts
- Failing to recognize the faculty time invested in the creation of new programs.

These kinds of internal staff actions can turn faculty away from participation in innovative efforts.

*National vs. Local Programming* Colorado State University will continue to participate in a number of regional, national, and international efforts with educational technology. However, the bulk of faculty efforts will be devoted to local institutional programs.

Faculty in higher education are much alike in accepting outside materials that enrich, but they reject outside materials that take over the role of the professor.

It has been suggested by some high officials in educational broadcasting that a few innovative efforts across the country are only delaying the implementation of nationally based programs in open learning. Well, I would hope so. The prospect of massive nationally produced programs – along with professional actors on the educational scene – only cause many excellent professors to rely still further on traditional methods. While such programs may be desirable for specific audiences, the nationally produced programs are not likely to have much impact on present university courses and curriculum. In this connection, the entry of higher education into cable television dare not fall under the influence of the traditional university broadcaster – many of whom have large staffs, fine facilities and a full schedule. . . .but have failed to get their own university faculty to use the medium.

One of the great contributions of CATV lies in the improvement of *local* communications and extension of educational opportunity. Again, CATV lends itself directly to multiple options in program production. We need to use CATV as a tool for results, not style.

*Internal Organization* We have found that one centralized media organization has been most beneficial in handling the broad needs of faculty. For example, each of the off-campus programs mentioned here was started by our Office of Educational Media with no new staff or equipment. When decentralized, programs must stand alone with separate staff, equipment and budget. Centralizing media operations is fiscally sound, and the management of the operation must be based on a strong service orientation.

I have illustrated a number of innovative efforts using videotapes that lend themselves to cable television. We look forward to this new resource and feel that the willingness and readiness of our faculty will lead to a broad spectrum of application. To that end we expect to be more concerned with results than with any standard style.

# CHAPTER 13

# Experimental Trends in Videoprogramming

by Kas Kalba

## EXPERIMENTAL TRENDS IN VIDEOPROGRAMMING

The task I have set for myself in this presentation is to provide an overview of ongoing experimental activities that may have an impact on tomorrow's educational programming, particularly with respect to higher learning. I have to admit, however, that this poses somewhat of a problem, given the limited space in this paper. Not quite as much of a problem as trying to present a capsulated version of world literature, but a problem nonetheless, for there is a considerable amount of activity going on in what I have described elsewhere as "the video implosion."[1] While video experimentation has not exploded as yet, in that most people, educators included, have only started to become aware of this area, the variety and intensity of innovation that has been launched during the past five years is nonetheless astounding. To introduce you to some of this activity, I will review briefly six or seven areas of experimentation as well as try to suggest some of the implications that can be made concerning the production of educational programming in the future.

But before I proceed with the review of the separate areas, let me indicate why current video experiments should be closely followed and why they are likely to remain important for some time to come. On the one hand, it is fair to say that we have had great promises about new

experimental technology and new experimental programming in the past. In examining video developments this past year, I have come across a volume on a conference about super-8 film that was held about 10 years ago in which great expectations about a communications revolution are also raised. Similarly, in experimental and independent filmmaking, some of the same paths that are currently being pursued in video have already been tried. And the results have not always been as encouraging as the proponents of experimentation would have us believe. In short, I am not guaranteeing that video is something unique or that it will develop in a way that previous experimental efforts have not. On the other hand, I should like to suggest some reasons why the impract of this latest round of experimentation may be more significant.

First, there is novelty involved and it is occurring on an unprecedented scale. We are currently witnessing the emergence of a host of new video technologies, including the portapak, video cassettes, and two-way video systems. These new technologies have generated considerable excitement on the part of entrepreneurs, artists, and "video freaks". Yet, like all novelty, the utilization of the new technology will be subject to fluctuations in aesthetic taste, market factors, and even politics; the novelty may wear off. What, perhaps, is more important is that video is more closely related to the television medium, and the existing pervasiveness of television suggests that perhaps some of these current experimental developments are likely to be implemented on a broader scale. I should add that in referring to the pervasiveness of television, I mean two things. One of these is the acceptability of television in our culture, especially the role that it has played for the young who now perceive the world in television terms as much as they do in book terms. Secondly, I am thinking of the practical availability of TV receivers. There are more TV receivers in homes, schools, and elsewhere than there are film projectors.

Obviously, the new distribution systems that are being discussed at this conference will also increase the potential importance of current video experimentation because they provide new outlets such as cable television, video cassettes, and multipoint distribution systems. And with these new distribution systems, new concepts of utilizing television are likely to emerge and gradually gain acceptance among the public and the educational community. In general terms, I see television moving toward what I have called "service video", which is to say that it will begin to meet our everyday informational and cultural needs in addition to serving as a purveyor of mass entertainment and dramatic newscasts.[2] I think all the new distribution systems will help orient television toward this new programming concept.

Finally, probably the most important factor that should be listed is the cost-reducing quality of some of the recent experimentation. I am

referring here to program production costs, which in some instances have been reduced to $100 or $200. This is certainly a different scale of production cost than even instructional television and certainly commercial broadcasting have been used to. To be sure, a trade-off is often involved due to the lower technical quality of half-inch equipment, but this is being worked on. The advent of programming and technical breakthroughs can no longer be denied.

## SOME SPECIFIC AREAS OF EXPERIMENTATION

So, with these opening comments, let me now focus on some specific areas of experimentation, which in the aggregate will, I believe, underscore the general points I have raised. First, the two-way video classroom. Mike Molenda in his paper, indicated that some of the major studies in this area have shown that two-way television used for instruction is not as effective in general as one-way televised instruction or as face-to-face lecturing. On first impression, this appears to be a startling finding. Most of the studies that Molenda referred to were based on systems utilizing one-way television plus an audio feedback channel. But it is also worth mentioning that additional studies say the same results occur when you use full two-way video, where both sides have audio-video capability at their disposal. One such study, conducted at Penn State by George Larimer and W. Ward Sinclair,[3] reports that students at the remote end of the system held a negative view toward the format of the course and received lower test scores upon its completion.

Keeping these initial study results in mind, I think it's also important to point out that in some cases, two-way television in the educational context, as well as in other contexts, has been used successfully. I believe the TAGER network, in this area, northern Texas, is one such example. I understand that Colorado State has also utilized this kind of system and has been happy with the outcome. In other areas of development, most notably in medicine, where several forms of telemedicine have been tested involving two-way communication between both doctor and patient and doctor and doctor, the system has worked out quite well, and similar video conferencing systems have been employed in the business sector as well as by government. For example, there is a demonstration system now in use in the metropolitan New York area that interconnects 10 county governments by two-way video for administrative and training purposes. I have recently been told by Rodman Davis of the Metropolitan Regional Commission that the system is quite effective.

Returning to the educational context, one of the key factors that may affect the success of two-way video interconnection is whether there is a live as well as a remote classroom. With a live classroom the experience is like to be more favorable and its students will learn more than those in the

remote counterpart. By equalizing the situation, however, and having only remote classrooms connected to a lecturing studio, the overall effectiveness of the two-way system is likely to increase. What you have done, in effect, is to structure a different kind of communications environment. The instructor must now start to orient his presentation towards remote students rather than pursue a conventional live classroom approach.

In addition, there are numerous technical issues which we are only beginning to understand, that have to be dealt with in the organizing of a two-way video communication system. Who should control the camera on the speaker, for example? Should it be the speaker, the receiver, or a third party? Should you see yourself on a monitor while you see the other person, or shouldn't you? Do you pretend that it's a face-to-face situation, in which you shouldn't see yourself? Or do you assume that video space is a very different kind of space and that, consequently, you should be aware of the fact you're coming across as an image and not as a three-dimensional person in a direct face-to-face contact? Theoretical and practical debates are going on concerning such issues.

Another area of experimentation is that of videopublishing. Basically, this area has developed around the emergence of the videocassette and the program production industry that this has generated. One contribution that videopublishing can make to our concerns is its development of new notions about how videoprogramming can be utilized. Videopublishers have produced complete self-instruction kits, an example of which we saw in Dave Wight's paper. Another example is Time/Life's production of a speed reading course with Dick Cavett as the narrator. In fact, the entire training area is expanding the utilization of videocassettes. You can now buy cassettes on how to improve your golf swing, how to invest in stocks, how to be a better manager (or employee), and how to sell automobiles.

In other instances, videopublishers are beginning to use videocassettes as reference materials. A cassette on baby care produced by Caravatt-Kleiman in New York actually contains about 50 separate segments. Some of them deal with general behavioral characteristics, others with the routine handling of babies, and a final section focuses on emergency situations. The information is very densely packed and you can refer to only that segment or segments which relate to your immediate concern. Moreover, you have the visual dimension which is an important asset particularly in an emergency situation when you are trying to decide rapidly whether your baby is experiencing, say, a severe convulsion. A printed medical guide cannot adequately illustrate what a severe convulsion entails. Obviously, this notion of video reference books has many points of transfer to higher education. The industry's experimentation with a variety of programming formats is another development in videopublishing that is worth following. The majority of

the productions fall into a few conventional programming categories, with a count of talking heads second only to instructional television. But new formats are also being conceived and tested: dramatizations, panel discussions, animation, and so on. And since the costs involved in these productions are substantially lower than those of commercial television, their potential transfer to education becomes especially significant.

## LOCAL CABLECASTING

It is worth pointing out that some regulatory uncertainty continues to affect local cablecasting. A couple of years ago, the FCC ruled that all cable television systems with over 3,500 subscribers would have to engage in local orientation. But that ruling has been challenged in the courts, and the FCC has not enforced it. I know that the Cable Television Information Center sent a letter to the FCC to clarify this situation, which has remained unanswered for a year.

Nonetheless, there are hundreds of cable systems that are providing local programming. In some cases, this type of programming takes on a very specific focus. For example, in New York City there was recently an "A for Art" series devoted to programming on local art. In Montreal, they have periodic news programs aimed at various ethnic minorities, Montreal being a diverse ethnic community. In Memphis, Tennessee, where a cable system is now being installed, there is a coalition of women's groups that is organizing an entire channel of cable television on a regular basis for women's programming. These are instances of highly focussed local programming. Usually, though, you're likely to get more of a mix, some talk and variety shows, coverage of town council meetings and other local political and social events, local sports programs, children's programming, and so forth.

Specifically, in relation to education, the most common type of program is a periodic newscast or talk show that lets the community know more about what's going on at the local school, high school, or even university in some cases. Such a program may announce school-related events, indicate educational programs that are being developed, as well as carry interviews with local school personnel. In other cases, retransmissions of closed-circuit broadcasts are provided for home-based students. There are also some examples of programming produced by primary or high school students such as "Kideo Video" in Amherst, Massachusetts. And, as you probably have already found out at this conference, there are a few colleges such as Oregon State and the City University of New York that transmit TV courseware on the cable system for credit.

The novelty involved in local programming is not so much new formats or new content. Talk shows, sports, and educational courses can

be seen on commercial and/or public television. Cable allows television with a very local character to emerge. This can be contrasted with conventional local broadcasting, which typically has a metropolitan orientation. Moreover, cable provides much more channel capacity for local programming, including a separate channel that has been allocated by the FCC for education uses.

The area of alternate video and public access involves substantial innovation in both content and format. Public access, as you may know, is now also mandated by the Federal Communications Commission with respect to new cable systems. The idea is that anyone can have access to a channel on the cable system on a first-come, first-served basis. Along with the advent of the portapak, this regulatory decision has spurred a variety of community groups to produce half-inch videoprogramming. In some cases, this programming reflects the values of the counterculture or a minority group; in other cases, it reflects simply the informational needs of a particular neighborhood or community organization.

A video group that exemplifies this new development is the Downtown Community TV Center, which operates in Manhattan's Chinatown. The subjects of the tapes produced at the Center vary from health advocacy and English as a second language to acupuncture and Chinese opera. Only about a third of the tapes the Center produces are in English, the remainder being in Chinese and Spanish (there is also a considerable Puerto Rican population in the neighborhood). The tapes are shown on portable monitors at community meeting places as well as on Manhattan's cable television system. And similar video groups are now operating in Minneapolis, San Francisco, Washington, D.C., Orlando, and elsewhere.

## OTHER USES OF VIDEO

Let me now briefly try to cover a couple of final areas. One has to do with the utilization of video in teaching, research, and professional practice. As some of you may know, there are very specialized uses of video. Here agin, the availability of inexpensive half-inch technology has led to a proliferation of video uses in medicine and psychiatry, in the arts (where it's used, for example, by dancers for rehearsal purposes), in real estate, and so on. In our courts today, judges are beginning to experiment with videorecording to edit out prejudicial material that enter into the taking of testimony from witnesses. Only the edited tape is presented to the jury. At the same time, the judge has to keep the master tape in case there is even an appeal of his or her decision based on how the master tape had been edited.

In the educational realm, video is being used for microteaching as a means of better evaluating a teacher's performance. The portapak is a

ready-made tool for seeing how you teach and how you orient towards students. Videotaping is also being used for educational exchange purposes. For instance, one of the courses I teach is on communications planning. When I want to do a session on interactive television, I have a video tape on PLATO that cost me $12 which I show rather than trying to explain the system on the blackboard. The tape does not involve elaborate production but it more than serves its purpose.

Video is also beginning to be used by students instead of term papers for preparing reports. Again, at the Harvard Graduate School of Design, three students recently produced a videotape on transportation problems of the elderly. It was their first production effort. Rather than being filed like a term paper would be, the tape has been shown to several community groups, and the Massachusetts State Department of Transportation has asked the three students to develop a follow-up tape for agency and community education purposes.

A parallel use of video is to record oral history. For example, students of urban history do video projects on individuals with long experience in a particular neighborhood who talk about the evolution of that neighborhood in terms of social and other kinds of change. It represents a valuable means of recording information for use in high school or college teaching programs.

Finally, what about video art? It is not unreasonable to ask what experimental artists have to do with education. I, for one, believe that the answer should be quite a bit. Take computer-assisted instruction: In the past—and fortunately, the PLATO system is beginning to disprove me on this point—CAI programs have been developed primarily by engineers, psychologists, and mathematicians. As a result the cathode ray tube has been seen as simply a series of lines for the display of alphanumeric information. While this has led to the development of logistically sound interactive programs, it has not always resulted in the most creative use of the medium. In short, I would argue that artists who might see the cathode ray tube as a canvas for visual manipulation could greatly improve the appeal and impact of CAI. They could have a similar impact on instructional television.

Video art experimentation has taken several directions over the past few years, including those of representational and conceptual art. The most striking developments, however, have occurred with respect to abstract video experimentation, thanks largely to the advent of a new tool called the video synthesizer. This is a machine or set of machines that allow you to take video images generated by a camera and process them in several ways such as adding color or rendering them more abstract. Experimental techniques of this sort could play an important role in the enhancement of future instructional courseware. In addition, as Nan June Paik, a founder of video art, has suggested, they could be utilized directly

in the teaching of basic principles of physics or electronics.

## IMPLICATIONS FOR EDUCATIONAL PROGRAMMING

Finally, let me summarize the implications of the various experimental efforts I have described for the development of educational programming. First of all, I think experimentation helps us become aware of a broader set of formats and methods for utilizing video and television. It increases our options for developing new programs. And it suggests that our concepts of television have been quite limited in the past. Mass television and instructional television, as we think of them today, are likely to constitute two points on a greatly expanded spectrum of television concepts in the future. Television will become much more like the publishing industry, with its mix of pamphlets, art books, manuals, best sellers, and Whole Earth Catalogs.

The second point that has to be made is that as educators we have to find ways of incorporating some of these experimental approaches into the production process. This will pose a considerable challenge but an essential one if we are to get away from the limited programming repertoire today. In some cases, it will mean getting video freaks and artists to work jointly with the more traditional instructional television producers. These two groups may have different goals and will certainly have different styles of approaching programming. The particulars of a cooperative approach will not be easy to organize, but the results could be very valuable.

And third, this review of experimental trends leads me to pose key questions about how media facilities at our institutions of higher learning should operate in the future and what they should look like. For example, should these facilities be primarily oriented to serving the needs of large-scale university publishing projects that are intended to produce very high quality programming for a broader market? Or should they serve the needs of the faculty member or student who wants to utilize a half-inch video recorder as part of a specific learning experience? These questions quickly lead to others having to do with budgetary decisions, the physical distribution of equipment, staffing needs, and many others. But they are questions well worth asking.

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# CHAPTER 14

# One University's System for Generating Television Software

**by Warland D. Wight**

In a time of declining support, a critical problem for higher education is to develop systems by which software can yield more efficient and effective learning. The creation of such systems will significantly alter traditional systems of higher education.

Governors State University is an experiment in higher education which tests some of the administrative structures necessary for using the techniques and technologies of mass communications instruction. Its concepts and some of its operational systems permit an easy adoption of television in conjunction with other materials as a primary means of instruction. If its innovations can be maintained, GSU will evolve a model for the application of television in the university. It has already developed a unique administrative system by which software is developed.

This paper details the GSU concept, its operation, and its potential in relation to a comprehensive higher education system that uses television effectively. It concludes with recommendations for cooperation among universities and within regions to develop a more efficient system of higher education.

## CURRENT PROBLEMS FOR HIGHER EDUCATION

Modern technology will be applied in higher education to accomplish the following: 1) to educate larger and more diverse populations than traditional instructional systems; 2) to reduce the capital investment required to expand higher education; 3) to reduce the cost of each student-generated credit; 4) to help solve learner and learning problems (droupout rates, inflexible scheduling, inefficient learning systems, and so on); 5) to move learning to the student, rather than force the student to learning; 6) to disseminate down-to-earth instructional programs based on performance objectives, which guarantee learning through evaluation and revision procedures.

## GOVERNORS STATE UNIVERSITY

To reach some of the above objectives, Governors State University has created a unique administrative environment which supports the creation of instructional materials: First, all instructional programs are based on competencies. Performance objectives are used to describe course content and the learning requirements for individual courses within a program, as well as to report student credit. The use of performance objectives forces the professor to identify the content and requirements of a course; thus providing an explicit guideline for developing instructional materials.

Second, every year, each professor develops a Profesional Work Plan Agreement. It is written in performance language. From each college, at least four professors are released from instruction to work with a Coordinator of Instructional Development to develop an instructional package or system. The package usually contains video cassettes, a student guide, audio cassettes, and/or other mediated materials. It programs the student's time to provide for contact with the professor and other students.

Third, instruction is evaluated. All instruction is evaluated and the evaluation data are used in merit salary considerations. The instructional packages are tested with students as prototypes and usually revised on the basis of the test.

Fourth, a centralized-decentralized operational plan exists which supports instructional development. This plan places the Learning Resources Center and the Instructional Communications Center in a wing, Research and Innovation, which is separate from Academic Affairs. The Research and Innovation Wing is also responsible for implementing evaluation procedures. (Figure 1)

At the heart of the university's effort to develop learning packages is the Instructional Communications Center. This unit is primarily

**Governors State University**
Organization

**President Governors State University**
Assistant to
the President

| | | | | |
|---|---|---|---|---|
| **University Vice President**<br>**Research and Innovation**<br>Assistant to the<br>Vice President | **University Vice President**<br>**Academic Affairs**<br>Assistant to the<br>Vice President | | **University Vice President**<br>**Administration**<br>Assistant to the<br>Vice President | |
| **Instructional Communications Center** | **College of Business and Public Service** | **Admissions and Records**<br>Admissions Counselors<br>Data Analyst<br>Financial Aids<br>Registrar | **Building and Plant Operations**<br>Safety Services | **Management Information Services** |
| | **College of Human Learning and Development** | | | |
| **Learning Resources Center** | **College of Cultural Studies** | **Student Services**<br>Counseling<br>Health Services<br>Student Activities<br>Testing | **Business Operations**<br>Accounting<br>Central Stores/Duplicating<br>Personnel/Payroll<br>Purchasing | |
| | **College of Environmental and Applied Science** | | | |
| **Research and Evaluation** | | | | |
| **Special Projects** | **Cooperative Education**<br>Placements | **Junior College Relations** | | |

responsible for stimulating and guiding the change from traditional means of instruction to the use of mass-dissemination systems of delivering instruction. The Instructional Communications Center (ICC) is a complex organization that combines many functions often dissipated throughout a university having a traditional organizational structure.

Most importantly, the Center provides instructional development support for faculty. Four Coordinators of Instructional Development are employed by this unit to work with faculty in developing instructional systems and packages. Each is attached to a different college. The Coordinator's Work Plan Agreement binds him/her to three primary responsibilities:

"1. To work with faculty and students in developing self-instructional modules (courses), instructional systems, and other instructional materials.

"2. To work with the College on curriculum and governance to implement the Instructional Systems Paradigm.

"3. To establish and maintain good relations with faculty members in the College and encourage and assist them in use of ICC services."

While this Work Plan Agreement was used during the first year to establish the credibility of instructional communications as a means of instruction, during the second year four faculty members in each college were contracted to develop an instructional system through the Faculty Work Plan Agreements. Secondly, the Instructional Communications Center produces media materials for the university: audio, film, graphics, photography and television. It produces instructional, public relations, and informative materials. Thirdly, it operates the electronic distribution network, which will include cable television channels this fall. Finally, it functions as a traditional audio-visual center by distributing and maintaining portable media equipment, film rental, and so on. The cenralized-decentralized plan of operation provides service for faculty and students, maintains a consistency among media systems in use by the separate colleges, and guarantees that the instructional development effort will not be diverted to accomplish other goals. In short, the Instructional Communications Center represents a primary commitment by the university to use modern communications technology in the delivery of instruction. Any lesser commitment would blunt the ability of the university to interest the faculty in substantial production efforts.

While only one-quarter of the university's instruction is designated as being in the individualized software package format, all of it is supposed to be developed into instructional systems. The Instructional Systems Paradigm was adopted as official policy for university-wide application. It specifies how each college should identify instructional programs and how each professor should develop the necessary course work. In figure 2, the system is outlined.

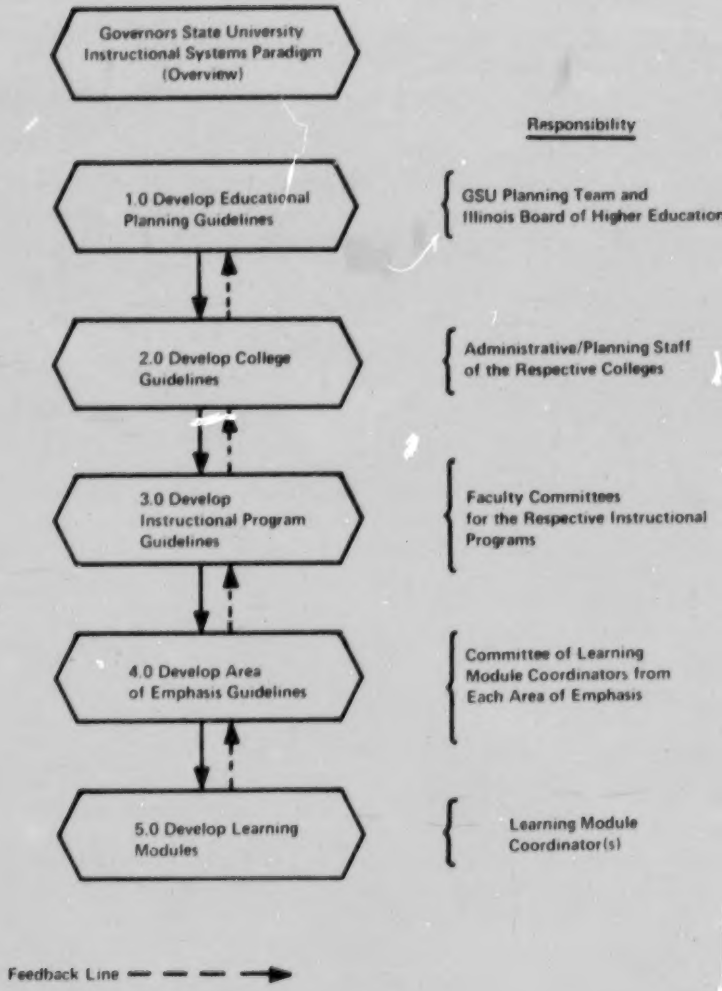
Governors State University
Instructional Systems Paradigm
(Overview)
Responsibility
1.0 Develop Educational
Planning Guidelines
GSU Planning Team and
Illinois Board of Higher Education
2.0 Develop College
Guidelines
Administrative/Planning Staff
of the Respective Colleges
3.0 Develop
Instructional Program
Guidelines
Faculty Committees
for the Respective Instructional
Programs
4.0 Develop Area
of Emphasis Guidelines
Committee of Learning
Module Coordinators from
Each Area of Emphasis
5.0 Develop Learning
Modules
Learning Module
Coordinator(s)
Feedback Line

**Fig. 2**

The important step for developing course work is step 5 that appears in Figure 3 I quote from the report, "The Learning Module (course) is a set of experiences which brings the student to the achievement of one or more specific and discrete competencies. Ideally, it is the smallest discrete 'package' of instructional strategies and materials in which all aspects of an individualized, performance-based criterion referenced instructional model can be identified. Such a model will include instructional objectives, materials and strategies for instruction and evaluation. A Learning Module will usefully approximate or include a single topic or concept belonging to a larger subject-matter context. A Learning Module at GSU, under current administrative procedures, will yield one or more GSU units of credit.

Developing of Learning Modules follow the establishment of the conceptual framework for the area of emphasis and the resulting specification of subject matter topics or concepts, performance characteristics and learning contexts that are appropriate to the area of emphasis. Development of Learning Modules then proceeds through the several discrete steps. (See Figure 3.)

The concept of an Instructional Systems Paradigm has been partly realized through the Profesional Work Agreement which contracts each professor to fulfill specific performance objectives.

The Work Agreements permit considerable flexibility in deploying the time and energies of faculty. (See Figure 4.) Time is allowed for developing self-instructional modules, for research and for developing unconventional learning experiences (such as cooperative education or extensive self-instructional learning). This flexibility is essential to effective use of cable television because faculty are given options and time to innovate as an expected part of their job.

The self-instructional module (SIM) is an ideal instructional system for use by cable television. It specifies competencies and objectives, provides a learning guide, and includes criterion tests and evaluation materials. The SIM is a coherent package of instruction which breaks through the limitations of traditional scheduling, permitting students to enter, learn, and exit at will. It deploys faculty time more efficiently by creating a faculty which produces learning materials, advises students, and concentrates on improving learning. Our faculty does not spend its time in repetitive lectures.

The student selects competencies and contracts for a definite program which is made up of independent studies, traditional courses, and instructional modules. Each module is a precise and explicit set of learning experiences designed to make the student competent at a specified task relevant to his/her program competencies. The objectives are stated in terms of the performance expected by the student within a module (course). Learning experiences stimulate reflection, group discussion, and creative thinking. Simulation games and exercises initiate the application of learning. Criteria tests guarantee performance. In short, students

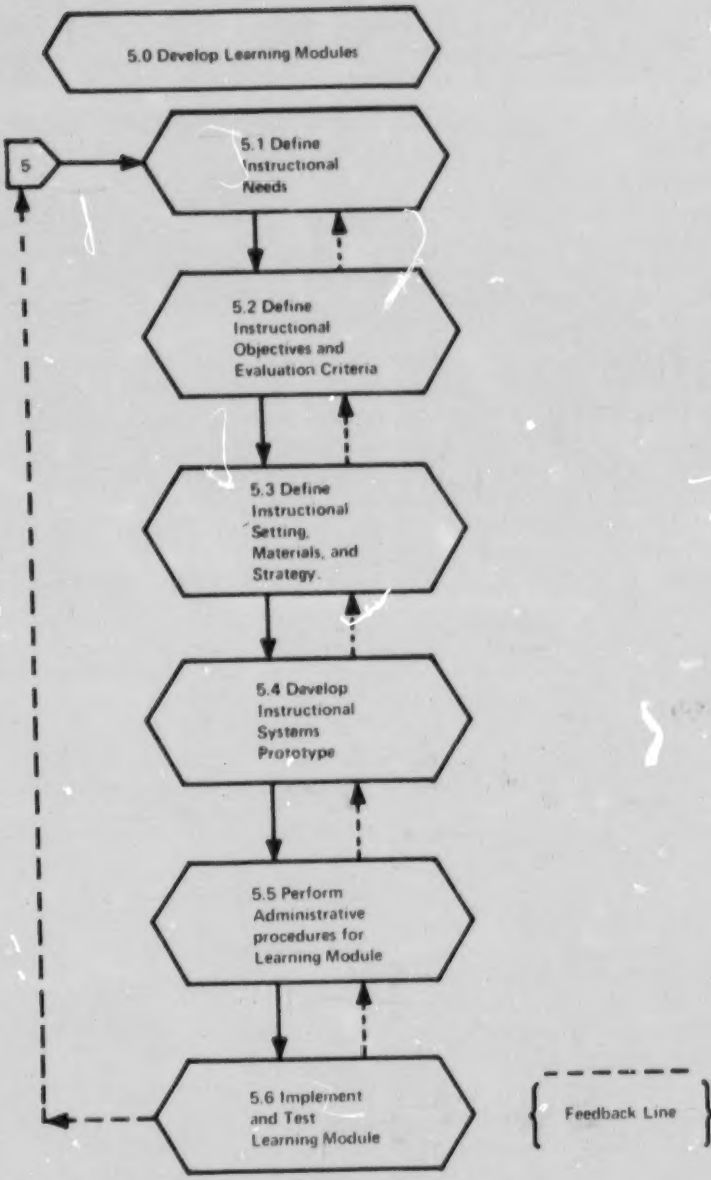
5.0 Develop Learning Modules
5
5.1 Define Instructional Needs
5.2 Define Instructional Objectives and Evaluation Criteria
5.3 Define Instructional Setting, Materials, and Strategy.
5.4 Develop Instructional Systems Prototype
5.5 Perform Administrative procedures for Learning Module
5.6 Implement and Test Learning Module
Feedback Line

**Fig. 3**

experience the learning system working for them. They learn because learning depends on their performance.

## THE RESULTS

Higher Education must obtain an economy-of-scale through mass dissemination. At GSU, a by-project, piecemeal approach to instructional development was taken initially because few faculty had done instructional development before. The Instructional Communications Center had to "sell" their services. Since the adoption of the Instructional Systems Paradigm, a careful process is used to develop instruction because demand soon outstripped the ICC's ability to produce. High demand and stable content areas receive priority. Instructional development is not cheap. It takes time and resources. The ICC employs 8 production people, 4 Coordinators of Instructional Development and technicians. By June, 1974, the staff will be 25. The economy-of-scale occurs when a single faculty member can serve a large number of students. It takes careful planning and high quality production to make it work. Figure 5 shows our estimates for developing one program through this means.

While wide use of SIMs permits a large population with different schedules to gain access to higher education, the traditional system of scheduling breaks down. (See Figure 5) Most universities charge fees and schedule according to a fixed time period, (a quarter, session, or semester). Use of instructional systems with a competence-based program contract, supports fee payment by competencies and breaks down the traditional schedule. The time and thought that goes into developing an instructional system has resulted in an extensive evaluation of instruction and revision. The revision process depends on the quality of evaluation measures. While competencies and performance objectives are explicit, evaluative procedures are still primitive. Thus, revision depends on the professor and coordinator collecting their own data and interpreting the results, because reliable and valid evaluation measures are not available.

The student completion rate of course work is another serious problem. GSU is on a two-month session schedule. Students seem unable to complete the work of two intensive modules in a session. While most modules are completed within three sessions, most are only scheduled for one session. Open-ended SIMs resulted in higher incompletion rates. So we assessed a definite schedule of deadlines to reduce the incompletion rate to fit the session time period.

The Open University in England uses broadcast television to fix a schedule of deadlines for students. Instruction via cable ought to be pre-scheduled rather than student-scheduled.

GSU built a 400,000 square-foot edifice at a cost of almost $2,000,000 below the state's allocation. The economy was achieved by using interior landscaping in place of walls. When cable becomes available,

But one person can only be so flexible...what can I do?
Hire a robot!

Fig. 4

Innovate innovate innovate
innovate innovate innovate
innovate innovate innovate
innovate innovate
innovate innovate
innovate innovate
innovate innovate
innovate innovate
innovate innovate
SESSION 2
SESSION 1

Fig. 5

the cost of launching a university could plummet down through the creation of a central Instructional Communications Center with outposts, instructional systems, learning packages and low-cost meeting places. Cable decentralizes instruction.

## RECOMMENDATIONS FOR ACTION

To utilize cable television as a means of solving current problems in higher education requires cooperation and action among existing universities. The following recommendations are suggested to initiate that cooperation:

1. Universities should evaluate their total higher education efforts to determine program compatibility among institutions, effectiveness of learning programs for students, and ways to cooperatively develop future resources for compatability and efficiency.
2. Higher education should develop plans for pooling learning resources and making them available on a regional basis.
3. Guidelines for statewide educational use of cable television should be established which guarantee equipment compatibility, university access within a region, and inter-connection of facilities.
4. The rights and responsibilities of professors hired to create SIMs and other material for regional distribution ought to be determined.

# CHAPTER 15

# Teaching by Television

**by Stan Gerendasy**

It has been observed more than once that instructional television has not lived up to the early expectations of its enthusiasts. Millions of dollars have been spent on it. Its literature fills libraries. The materials produced for it could fill warehouses. Yet television plays, at most, a marginal role in our educational system. There is no single explanation for this. Faculty resistance, institutional inertia, differing attitudes toward the use of television among the thousands of autonomous school systems and colleges throughout the country have all contributed to its spotty record. But high on the list of negative factors must be included the lack of sufficient, high quality programming.

First it is fair to ask if there is any evidence that the kind of programming used makes any difference. The research doesn't address the question directly. The "no significant difference" findings of Dubin, and others compare televised classes with the same materials presented face to face.[1] They find that the televised classes are as good or as bad as the live ones, suggesting that they are basically as good or bad as the live ones, suggesting that they are basically as good or bad as the teachers giving them. This is an important point, but it doesn't tell us about the relative effectiveness of different programming approaches.

Schramm and Chu address the question somewhat more directly by

looking at some simple production variations to see how they influence learning.[2] Here in broad outline are some of their findings:

1. There is no clear evidence of the kind of variations in production techniques that significantly contribute to learning from instructional television.
2. There is no consistent evidence to suggest that either humor or animation significantly contributes to learning from instructional television.
3. There is insufficient evidence to suggest that dramatic presentation will result in more learning than will expository presentation in instructional television.
4. Inserting questions in a television program does not seem to improve learning, but giving the students a rest pause does.
5. The students are likely to acquire the same amount of learning from instructional television whether the materials are presented as a lecture, or in an interview, or in a panel discussion.
6. There is insufficient evidence to suggest that color will improve learning from film or television.

So it seems there is either insufficient evidence, or again no significant difference. One begins to wonder if the Hawthorne Effect has been repealed. In that case, at least, no matter what was tried, performance improved. In instructional television, it seems that no matter what is tried, it makes no difference.

But somehow this can't be true. Obviously, some television programs are better than others. A lively one is better than a boring one. An instructional program that holds attention has to be more effective than one that doesn't.

There is another factor to be considered. Much of the emphasis at this conference is on non-traditional education. This means viewers may not be as well motivated as regular students. Producers of instructional television will have to hold their audiences by the force of their programs and against competition. Quality will count.

## SOME ELEMENTS OF SUCCESSFUL PROGRAMS

It would be nice to follow that pronouncement with a foolproof recipe for successful programs. Unfortunately, there is no such formula. There are some elements, though, which successful programs seem to have in common.

Successful educational television programs are nearly always a result of collaboration between educators and television people. This is hardly a revolutionary concept. I raise it because despite its obviousness, it is often overlooked. The Sesame Street group, even with their extensive background in television production, recognized the need for academic

input to the program design. The British Open University establishes a team of educators and television professionals from the BBC for the production of each series. The Chicago TV College produces its programs in collaboration with a local public television station.

The Maryland College of the Air, which combines the efforts of several junior colleges with the program skills of the Maryland Center for Public Broadcasting, says this about their procedure:[3]

> "Content for courses produced by the Maryland Center is developed by committees made up of representatives from participating colleges. All are specialists in their subject areas. Once the general content is approved, the Center selects a teacher to produce the course from the general outline. TV scripts then become the responsibility of this teacher who will also become the on-air presenter. The scripts are developed jointly with the Center's television people and, hopefully, the two skills produce a television course that is academically sound and visually exciting."

Successful programs are more and more the product of a consortium of schools. This makes financing and marketing easier but it also has software implications. Educational programs should be oriented to the consumer. In many cases, the participating schools are the immediate consumer, and, of course, the programming should be made responsive to their needs. But even when the programming is not produced for in-school use, a consortium-directed effort can reflect the needs of a wider range of constitutencies and make the programming more relevant.

The National Instructional Television Center (N.I.T.) believes that this involvement on the part of participating agencies is crucial to the success of its programs.

*Inside Out*, a series on health education for eight to ten-year-olds, which N.I.T. is enthusiastic about, was developed through the resources of a consortium of 33 educational and broadcasting agencies in the United States and Canada, which may be a world record for getting agencies to cooperate. Second place may belong to the Southern California Consortium for Community College Television which includes 31 colleges. About 5,000 students enroll each year in that program for televised college credit courses. Some of the courses which have been offered are *History of World Theatre*, *Law for the 70's*, *Introduction to Astronomy*, and *Consumer Education*.

The Maryland Center for Public Television, mentioned before, works with 17 colleges throughout the state to produce the Maryland College of the Air. Its major use has been for extension studies. There has been no attempt to make use of the on-air courses to augment the curriculum for students doing full-time work on the campus. The programs are carried both on broadcast television and on cable system throughout Maryland.

Nearly all producers of educational television stress the need for

designing programs with specific educational objectives. Equally important is testing to see if the objectives are being met, and revision of the program design if they are not. Many programs go through several revisions in this process until the producers are satisfied that the program is accomplishing what it set out to do.

The State University of Nebraska in its SUN Project plans to use test audiences not enrolled for credit to provide individual evaluations of pilot materials as they are produced.

The Children's Television Workshop emphasizes the use of research as an integral part of the program development process, testing segments, and then programs, for attention holding and educational effectiveness as well as for overall evaluation of penetration and impact.

In March 1972, Kentucky Educational Television undertook to design and produce a G.E.D. preparatory series for adults. G.E.D., General Educational Development, offers an examination to people of post-high school age who have not obtained a high school diploma. Upon successful completion of the G.E.D. exam, a high school equivalency certificate is issued. Kentucky ETV'S schedule for development of the series is a good example of the kind of research, development, and evaluation which can go into an educational television project. Here is their plan:

*March, 1972:* Funds totaling $126,000 from the Appalachian Regional Commission, with $441,000 from the governor's executive budget, starts the two-year project. In the same month, an eight-person staff begins researching, designing, and scripting the five G.E.D. Subject Areas.

*April, '72:* A national task force of adult educators, broadcasters, and content specialists join Kentucky Adult Education Instructors, learning lab coordinators, and G.E.D. students to determine skills, content objectives, and software. It's interesting here that students are brought into the planning process.

*June, '73:* Content completed. Production begins. From March 1972 to June 1973 means that 15 months have been spent on preparation before the start of production.

*October, '73:* A vadidation team begins testing the effectiveness of G.E.D. programs and written materials with adult viewers.

*March, '73:* Activation of a six-point utilization plan to attract, motivate, and maintain adult interest.

*September, '74:* Kentucky Educational Television broadcasts the G.E.D. series statewide for evaluation purposes.

*December, '74:* G.E.D. evaluation completed.

*January, '75:* G.E.D. series, including tapes, printed materials, validation results and utilization/promotional models, available for national distribution.

The design of instructional television must take into account the way

the material will be used. Will there be a teacher showing the program in class or is it meant for use at home? Again, it seems obvious that this difference would influence the design of a program, but the vast majority of educational programs seem to be oblivious to it. It makes a different not only in the content and style of presentation of programs but perhaps more important, whether teachers will accept them or not. Teacher's concerns about instructional television are based not only on fear of displacement but also on whether the materials used open the learning process or close it. The overwhelming preference is for teaching modules which can be used to stimulate further classroom work. This may also be a matter of job security, but there is probably a sound educational justification for it as well.

Programs for viewing at home carry a different burden. In most cases feedback will be limited and thought will have to be given to effective substitutes for interation. Redundancy may be one answer. Televising student interaction within the program itself may be another. The thing to keep in mind is that it *is* a design factor.

Another question which comes up often is the matter of budgets. How expensive does instructional television have to be in order to be good? We have all seen effective, imaginative programs that were produced on a shoestring and we have all seen million dollar diasters. The consensus seems to be that money doesn't guarantee success but that lack of it is even worse.

*Inside Out,* the N.I.T. health education series mentioned before, was a three-year project with a total budget of $750,000. Thirty fifteen-minute programs were produced. Of the $750,000, about one-third went into development, one-third into production, and one-third into preparing teachers to use the series and for general utilization expenses.

*Man Builds Man Destroys,* a series on environment produced by the New York State Department of Education, cost about $300,000 for 22 thirty-minute programs.

*Images and Things,* an art education series made under the supervision of N.I.T., cost $450,000 for 30 programs. This included development, production, utilization, and evaluation costs.

The Kentucky Educational Television series for high school equivalency is budgeted at $568,000 for 40 half-hour lessons covering the five parts of the G.E.D. exam. Again this includes development, evaluation and utilization costs, as well as actual production.

Amortizing total costs over the number of programs produced, most of these budgets seems to cluster at about $15,000 per program. The general feeling is that one can't go much below $10,000 per program and still maintain quality, this applies, of course, to programs in which the camera is taken out of the classroom and uses cinematic or television production techniques to achieve their aims. A program consisting of a camera locked on a teacher lecturing can cost as little as $50 a program.

This brings us to the subject of the much maligned "talking head." For years the talking head has been a synonym for bad television. But the tide may be turning. The talking head has its defenders and may be on the road to rehabilitation. One ETV expert extolled "the intelligent, infinitely flexible human face as the best audiovisual or 'production' device ever invented, or which ever will be intended."[4] It all depends, it seems, on whose face is doing the talking. Another ETV producer said that he would be delighted to use a talking head if the head was that of Robert Frost reading and discussing his poetry. Lacking a Robert Frost on the faculty, one might be forced to take other approaches.

## TOWARD THE FUTURE

Because there is no formula for success, the would-be producer or video publisher will just have to take his chances. From the standpoint of quality, educational television programs will follow the same Gaussian distribution curve as do books, films, paintings, or other creative efforts. Some will be very bad, some will be very good, and most will be so-so. This has not discouraged the production of books, films, and paintings and should not discourage the production of educational television.

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# CHAPTER 16

# Come On, Give It a Try

**by Christopher Sarson**

In this paper,* I want to explore – and maybe even explode – some myths. Not, I hope, destructively, but helpfully so that you can instigate viable, exciting, and innovative programs for your audience.

Whether you like it or not, you're in show biz. And you must realize this; if only because your students normally watch television to be entertained. And they expect to be entertained. And they expect to be entertained when they are watching your software as well. But have no fear! They will be educated as well as entertained. I stress this because history shows that educators tend to forget this.

A few years ago when they were pre-schoolers, two children listened dutifully as I pontificated one October 14th on the significance of Columbus Day. "Many years ago," I began, "a man called Christopher Columbus sighted land after many days at sea. He dropped anchor. Then he and a few other rowed timidly ashore."

"Oh, yes," exclaimed my five-year-old daughter, "we know this story. When he arrived, Bugs Bunny showed him how to eat corn and helped him make friends with the Indians."

Make no mistake, children learn from television, often unconsciously. And so do adults. The other day on a New York morning talk show, a local politician was talking about the gas shortage. He pointed out that

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nobody knew for a fact how much gas there was at that moment in the United States. But people had learned from television that there was a gas shortage. "If you and I were to state quite seriously that there was a shortage of women's girdles," he said to the host "then by tomorrow afternoon there would be." This man was not underestimating the power of television. Most of the knowledge of most of the people (what a terrible generalization!) comes from television. And most of that most is not direct instruction: It osmoses – it ooozes – on to the viewer.

## SOME BASIC METHODS

Television as it stands, even without university cable vision, is a mightly effective teacher. Don't ignore the lessons the broadcasters have learned. And the first myth to explode is that I, or any other television professional (as Stan Gerendasy pointed out in his paper), can teach you a unique way of designing programming especially for university cable television. There are some short cuts, but the basic methods of creating good effective television are the same, whether the method of broadcast is open or closed. And these methods are super simple.

First you make plans:

- Do your research
- Test your assumptions
- Think about what you want to say. Clarify content.
- Examine whether television is a good medium for this message or would radio be better?

Second, you examine what tools you have at your disposal; the tools you need may be different from those used in open broadcast. For instance you might include instant feedback in your inventory. Enlarge your inventory if you need to and the budget will permit.

Third, you plan how you're going to execute your content with the tools at your disposal.

Finally, you make it happen with imagination, flair, and style. And this last part is easy if you have done the first three parts well. Planning is the hard part. The execution is relatively simple.

Remarkably like teaching, isn't it?

I've glossed quickly over these points because, of course, there's no guarantee to assure you success. You need the right combination of circumstances as well as the good basic plan I've outlined above.

## THE STORY OF ZOOM

Let's consider a case history and watch some examples. Several years ago, I formulated some concepts for ZOOM, a program for pre-teeners, which were based on observations of my children and others.

First, ZOOM would provide a forum for eight-to-twelve-olds, who, I believed, could write, present, and enjoy a first-class television program.

Second, ZOOM would reflect the life of the eight-to-twelve-year-old in America. (To this end, I cast seven "average" youngsters. And I decided to change half the cast every six months, so that the youngsters would not become stars, but representatives of the audience.) Also, ZOOM would feature each week a youngster whose life style was significantly different from the majority of the audience.

Third, youngsters would originate the ideas, written material, and creative input for the program. Competent adult television professionals would shape these contributions into a weekly half-hour program.

Let's look at three examples from ZOOM, which may explode some more myths.

*The Princess who didn't want to be rescued* [three minutes]

Scene opens with girl dressed in pointed hat and veil at window of castle tower. She cries "Help! Help!" Boy gets step ladder and climbs up to rescue her. "Get lost!" she says. "But don't you want to be rescued?" he asks. "No," she says firmly. "All princesses who are locked in towers are supposed to cry for help." He goes. Another boy/prince comes and is sent away. Third boy walks right past tower and princess yanks him by the collar. "Hey, aren't you going to rescue me?" "Why?" he asks in surprise. "Because all princes are supposed to rescue *me*," she begins and starts to giggle. He starts to laugh too, and off stage you can hear the other Zoom children laughing. Fade to black, and they redo the final scene, but collapse into laughter again. Princess hits price over head with her tall hat, which he puts on, and starts jumping around amid more laughter. All leave stage. Last boy comes back to say "Well, we never did get that play right, but if you have a play you'd like us to do and get right, send it to ZOOM."

Why did I allow a piece like that to be broadcast on ZOOM? For many reasons:

- It certainly reflects the life of an eight-to-twelve-year-old. Few youngsters fail to recognize the situation in which they can't help laughing during a part of their lives when they're supposed to be serious.
- It confirms that the ZOOM cast is fallible and human. (However hard we tried, the cast became stars, just as teachers or university cabletelevision professors will become stars. And the audience, *any* audience, warms to a demonstration of this fallibility)
- It encourages the audience to try something at home. Even if they fail. Trying is more important than succeeding.
- And, it encourages participation. It brought in plays. Heavens, did it bring in plays!!!

Would you allow a piece like that to be included in your university cable course? Probably not but there won't be so-called imaginative, stimulating, exciting, innovative programs on university cablevision until

you do.

*The Elephant and the Frog* [30 seconds]

Nancy, one of the ZOOM cast, is sitting on a chair holding a piece of paper. She reads a story sent in by a young viewer straight from the text she is holding, using a deep throaty voice for The Frog and a higher squeakier voice for The Elephant. The story is a simple one about the Elephant asking the Frog to tea and stepping on his foot so that he jumps. "Do it again" said the Frog." At the end of the story she looks up and smiles.

"The Frog and the Elephant" is another of my favorite ZOOMbits. It explodes the myth which says you can't have a talking face. You can. If it's an entertaining talking face. And Nancy's is. And it worked.

One of the most successful pieces of television I've every seen had nothing to do with ZOOM. It was a talking face that didn't talk. In the really "olden days," long before color television, NBC used to broadcast symphony concerts. Nowadays (thanks, incidentally, to regular broadcasts of the Boston Symphony Orchestra by WGBH, the public television outlet in Boston), there's a sophisticated 4-camera set-up which can show whatever section of the orchestra the producer thinks is important for the viewer to focus on. But in those days, the producer would be sure to focus on the only thing that was constantly moving and consistently expressive – a mid-shot of the conductor, who happened to be Toscannini. These are now historic tapes. They show a great conductor – sometimes happy, sometimes furious, cajoling, nursing, exhorting an unseen orchestra to perform. Remarkable television. A talking face which doesn't even talk! Think about it!

*Roland Granfords, ZOOM Guest, Connecticut* [seven minutes]

Roland appears on the screen as a lively tousled hair boy who speaks with some difficulty and uses sign language. He is at the American Summer Camp for the Deaf. The voice of a child is used throughout the sequence expressing Roland's own views of what happens at camp. The day begins with a camp inspection in which Roland and his three cabin mates have to clean up and are rated. We see him in a basketball game which his team wins ("We're the champs" he says proudly to the camera). Finally at the talent show, there is a funny skit about two deaf people driving a car who are continually stopped for speeding, with Roland and another boy acting it out. The segment ends with Roland inviting the ZOOM audience to write in for a ZOOM card in order to learn sign language.

Traditionally an unctious voice-over would have explained how this youngster and many like him communicate and enjoy themselves "in spite of their handicap." Instead, we presented a lively, active, fine youngster who appealed to both the hearing and the hearing-impaired – on his own terms. And incidentally, the audience's reception of that piece led us to

invite Roland to the studio, where he played games with the ZOOMers and talked with them about his life in Connecticut.

**FROM ZOOM TO ONE**

A month ago I left ZOOM and WGBH in Boston to become Executive Producer of Television at Education Development Center in Newton. Our first project, appropriately called project ONE, aims to help minority eight-to-eleven-year-olds become more literate in mathematics.

Right now, we're at the planning stage. We are testing assumptions about our target audience. And mathematicians have identified five topics which constitute the basic literacy of math: – counting and ordering, the concept of measurement, scaling and mapping, estimation, and graphing. And we're concentrating on a problem-solving approach to the learning of these topics.

As the mathematicians refine the content, I am building a team of television professionals who will devise the techniques and television methods of presenting the information to the youngsters.

Soon we shall begin producing the programs, which are only one of the three components of project ONE. We're also involved with teacher training and hands-on activities. We want to make math live for the youngster, to make him or her comfortable with quantitative teaching. And to cure him from getting a tight knot in his stomach whenever he hears the dreaded word "mathematics."

It's significant that ZOOM was designed to appeal to a relatively small audience (children eight to twelve). Yet, it has the second largest audience in public television. Our project ONE audience is even smaller. But I have a suspicion that although our *target* audience is a very specific one, the appeal of the program will be to a much wider audience.

Your programs too may be geared towards a much smaller audience. But in order to keep them awake, you must entertain them. And if the programs are good, the success will ripple outwards and extend your reach and influence into the global village in which we live.

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# PART IV

# CHAPTER 17

# The Possibility of the Future: Toward the Big Wired Wonderful World

**by Roger B. Fransecky**

**That's the reason they're called lessons," The Gryphon remarked: "because they lessen from day to day."**
**– Lewis Carroll**

During the past half-century, higher education, American style, has claimed and has had claimed for it both too much and far too little. It was to "build a new social order." It was to be the great national stabilizer. It was to open wide the gates of social and economic opportunity to all people. It was to provide the manpower and requisite skills to anticipate and to meet all of the demands of all the users of the every-renewing technologies. It was to bring peace and culture and plenty to the citizenry which the school creates, who themselves would establish a garland of New Jerusalems to grace this fair land. It was to convert information into knowledge and knowledge into wisdom and wisdom into working programs which would assure the dignity, the strength, and the joy which are man's birthright. In every one of these enterprises, education has been a mare's nest of success and failure.

Because of this dubious record, educators, except in their palmiest moments, have many doubts about the effectiveness of higher education. Some doubt that we can claim any credit for any subsequent success of

students. Some suspect that beyond mere literacy, there remains only tracer elements of the student's experience in the adult's behavior.

Within this context, it's no secret that our harshest critics, many of whom wish to dismiss the institution of education as no longer relevant or viable in the affairs of society, raise serious questions when one discusses utilizing available technologies to extend and enrich our "traditional" programs.

Telecommunications and the metaphor of abundance suggested by cable offer educational policy planners, curriculum designers, and academic professionals what some have described as a "cornucopia of video delights." Many have found the metaphor suggested by cable an important antidote to the collective despair which seems to characterize much of the literature of higher education. The new cable programming base suggests what higher education institutions can do to provide new programs to "new" students who no longer share a concern about credentials, certification, and what is sometimes superficial achievement affirmed with a diploma.

Many educational planners have adopted or adapted technology to extend the possibilities of higher education to new, untapped clients. Echoing the optimism of the Carnegie Commission on Higher Education,[1] they have discovered a "fourth revolution" portended by developments in electronic media, notably those involving television and computers. But the adoption of instructional technology on many campuses is an uneven, even faltering, phenomenon. Few rewards exist for those faculty members committed to developing new courses utilizing media delivery systems, a process that requires the development of new professional skills. Similarly, many have been disenchanted by persistent findings that the learning that results from such instruction is not significantly different from that of (in the words of the Carnegie Commission) "good professors and teachers using conventional modes of instruction."

Universities, to the extent to which they are familiar with cable television and other telecommunications delivery systems, may view it as a new metaphor of abundance with the attendant bold possibilities and new flexibilities suggested by a multi-channel model. At the same time, realistic university planners view cable as yet another drain or diminishing resources at a time of no more and not enough. The experience of education technology doesn't help bolster the spirits of those who view cable as helping to redefine the whole notion of learning space, while extending new opportunities for non-traditional study in continuing education. It is my own bias that such a change will occur only if university leaders make major public policy decisions, decisions which will force a reallocation of our existing resources to develop the programming that people will watch, programming that transcends the traditional "talking face" syndrome which appears endemic to most educational

television. While all the evidence is not in, it would seem unlikely that such a decision will come within the next few years.

## ANOTHER IMAGE OF THE FUTURE

The model developed by the University of Cincinnati may be worth considering on a broader basis: namely, the role that the University of Cincinnati, a major municipal urban university, has played to enrich the cable planning process in the city of Cincinnati and within the 44 separately constituted municipalities and townships composing the Greater Cincinnati Metropolitan Area.

To date, the University Media Services Center, the University's central instructional development, design and media resources agency, has served the community and the University in a number of ways.

- As an *advocate* for sound and responsible cable planning in the community
- As a *consortium* base for cable planning for the six area institutions of higher education, as well as the base for *systematic programs in citizen education* in cable in cooperation with area religious, social service and health agencies
- As a *research* base for local public policy development activity, as well as the base for a major *HEW-OTP study of alternate methodologies of delivering health care, social service, and educational services via cable.*
- As the *study base* for a major Task Force or Urban Cable Communications study for the City of Cincinnati, a seven-month citizen professional study, and a technical-economic feasibility study commissioned by the Hamilton County Commissioners for the 44 townships and municipalities which constitute the Tri-state area. The City of Cincinnati study, for example, suggests that a unique non-profit public corporation be established as part of the total franchising process; this model may be worth examining for it suggests several avenues of involvement for the area universities in collaborative program development.
- As a *legitimate program* resource for the development of new programming of new programming for cable, both locally and nationally. (For example, while we've had had extensive medical education programming on the University campus, we have had some difficulty adapting the "Open University" model to many of our "traditional" courses.) We have defined a program planning cycle which I'll discuss in some detail.
- As a *unique education forum* for government officials and franchise applicants before the formal franchise processing begins (The process is, to our knowledge, unique to Cincinnati.)

I share the hope that cable will profoundly affect the essential model

of education at the University of Cincinnati. In all candor, however, it seems unlikely that we, like most major universities, will make a broad institutional commitment to developing new programming for the cable. I feel that we can perform the role suggested above only if we are a viable and credible influence in the community, and if our own political interests in cable are well understood and highly visible. Cable planning can be a high-risk strategy for a university, but there are many of us who believe that it must be if cable is to become more than a conduit to the homes of the new, untapped clients.

If cable is to represent a genuine model of abudance, a model which suggests the responsibility citizens and learners on all levels have in creating greater access to information in our society, then public decisions have to be made regarding ownership, program development, and incentives for university involvement and cable television. Cable television is yet another example of how universities cannot stand apart from the society they serve. Policies can no longer be legislated from within institutions alone. The features that most distinguish the university as an institution have worked great changes in the context of policy, features which suggest a radical departure from the stance of institutional self-sufficiency that was once our precondition and premise.

## SOME MAJOR POLICY ISSUES

Sound cable planning on a collaborative base raises a number of major policy issues:

- *Cable planning forces us to analyze and to further define the nature of institutional change.* Such planning, if taken seriously, will demand a wrenching reallocation of our existing resources if we are to develop alternative ways to deliver health care, social services, and educational services on the cable. To date, few institutions seem willing to make that commitment, especially when one considers the immense political implications of such a change.
- *Serious cable planning suggests the need to develop new patterns of institutional collaboration and interaction.* What, for example, are the possibilities of software tradeoffs between institutions, of new purchasing patterns for materials, of intra-institutional faculty appointments? All of these arrangements and others suggest that a consortium arrangement for cable planning may be a viable possibility if the political liabilities can be overcome.
- *Collaborative planning focuses the need for training and retraining* if we are to develop telecommunications professionals on university campuses. Many faculty members may be unwilling to accept such training as viable, but training *will* be necessary.

- *The issue of user acceptance of telecommunications delivery in education* (as well as health care and social service) is a troubling one. How will the home user/reviewer "feel" about this educational experience? If the educational program is offered on a one-way basis, what opportunities for interaction is the learner denied? How, for example, does the welfare mother feel about pediatric services delivered from street clinics wired by cable? Or the high school dropout who must drop in on a scheduled TV class?
- *What are the economic tradeoffs* which may be possible if university services are delivered off-campus? The Commission on Non-Traditional Study Report, *Diversity by Design*, and others have suggested the role the new, part-time student will have in shaping our institutions during the next decade. How are we going to reach these new students in new places, except through the existing technologies?
- *What are the current regulatory and jurisdictional constraints* affecting cable television in municipal areas? What role, if any, do the local educational planning agencies play in negotiating educational channel allocations with the local, state and federal regulators, and the franchise interests? What are the copyright issues raised in software tradeoffs? With the FCC still groping for consensus on some of the critical legal issues affecting cable's development in the city, this may remain an open issues for some time.
- *How do professional educational planners legitimately involve community representatives and users* in planning for cable development? At what point should these "new students" be involved in the total planning process for cable?
- *How do we measure the benefits or liabilities* of the new service patterns suggested by cable? Our own work in establishing cost-benefit formulas in analyzing new service delivery systems suggests a dirth of useful material applicable to critique of cable use.

## THE POSSIBILITY OF CHOICE

As we approach the future, at least those parts of our future which do not seem entirely predictable, we still see the possibility of choice. Decisions on the scenario for higher education's future must not be the business of machines, nor of technological developments alone; it ought to, as it was in the past, be the prerogative of the most responsible, well-informed, and reasonable educators and humanists who share a common vision and concern: What kind of schools do we want? What kind

of person do we need to live in the decade before 1984? What choices are still possible? What of the future?

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# CHAPTER 18

# The University and the Cable: Some Practices and Principles

**by John Sheperd**

We have had experience in working with TelePrompTer of Oregon in helping to develop the potential of cable television as a unique form of communication between the University of Oregon and over 28,000 homes of the community over PL-3, a dedicated channel on the local cable system.

There is a temptation in meetings such as this for us to tell each other how we do it at old Siwash, and then the discussion becomes a contest between the participants to establish the fact that Siwash is far ahead of Kumquat University in the marvelous new field, whatever that happens to be. Perhaps this can be avoided, since I'm not from Siwash, and haven't been at old Kumquat U. for years. Instead, let me recount a couple of examples of the kind of thing we've been doing at the University of Oregon for about the last 10 years as illustrative of the principles involved.

## SOME HISTORY AND BACKGROUND

Before proceeding on to this somewhat non-esoteric goal, it is probably necessary to set the scene a bit and provide at least a little history of our operation. This will take about an hour and I'll follow with a 90-item true and false test, so I advise you to take notes. With that

warning, very briefly here are a few facts:

It all started (to coin a phrase) in 1964, really as the result of student unrest. Sometimes some of us associated with the disturbed years on campus forget that at least a few of the changes which came from that turbulence have been for the best! We had established the usual closed-circuit system which fed into classrooms and a few of the dormitories, and some of our faculty began to use the facility to send down the line materials supplementary to their instruction in class. But then began some grumbling among those in the fraternity and sorority houses as well as graduate students who were housed off-campus who could not get the service. In the established tradition of the era, a delegation called on the President, and shortly thereafter we were asked to investigate how the requested service could be rendered. We looked at a number of possibilities, including Instructional Television-Fixed Service and regular open broadcasting, but opted for the possibility of feeding directly into the local community cable. The cable company wanted it because it saw a chance to merchandise this to the community; we wanted it because it meant we could solve our problem. Which maybe illustrates the first principle, as articulated by that old philosopher of the funny papers, Colonel Bullmoose: "What's good for General Motors is good for the country." Aside from the depths of the wisdom contained in that gem, it *does* illustrate one important fact that anyone getting into this business must recognize and honor at all times — *cable-casting is different from broadcasting.* While we operate a feeding studio to our regular open-air television transmission system within the state, we have found that many of the materials which we transmit on PBS serve very unique and individual needs for our community which would simply *not* be suitable for regular broadcasting. As I provide you the examples later in this presentation, I hope that this most basic principle becomes abundantly clear.

All television operation and production on the campus is the responsibility of the Division of Broadcast Services & Televised Instruction, which operates studio equipment including IO and Vidicon cameras, Sony Porta-packs for remote productions, and a wide variety of videotape machines of different configurations. DBS is manned by a staff of 7, most of whom have joint appointments in some related academic area. Five graduate fellows work in the Division, as a means of earning a support stipend which permits them to work on advanced degrees. Which illustrates a second principle which should be noted: *There is much to recommend rooting such a service function in some academic relationship, thus making it possible to accomplish the service functions but at the same time, to keep a close relationship to the academic goals of the institution.* This is a noble effort; one which is fraught with danger, yet worth making, in my opinion.

## THE GIANT RUBBER CRAWL

Our system operates from 9:00 AM until 11:00 PM, five days per week, and occasionally on Saturday or Sunday for some special event. It carries a wide variety of instructional and informational materials ranging from bits and pieces of demonstrations for a particular class, to films transmitted for class review, to discussions of the community issues, to typed announcements on a GRC Information System. "GRC" is a technical term, which probably needs definition here. Our engineers put together a fixed vidicon camera, two rollers from a washing machine, and an endless belt of rubber, and hence the *GIANT RUBBER CRAWL*, or a GRC Information System, on which is hung various types of messages designed for community or campus information which can be transmitted any time a program is not available. And this illustrates the third and fourth principles: *Don't get into this business without a good engineer* and *be sure to provide yourself with something inexpensive to program during the time you'll not be using the system or you may find yourself in trouble.*

So much for the history and background; now on to the two examples which should be illustrative of what the relationship of the University and the municipal cable system can really mean to both of them.

The first example has to do with the Special Project for the American Academy of Orthopaedic Surgeons, which we produced in June of 1973. A representative of the Academy came to us early in the year with the explanation that the organization would hold one of its postgraduate seminars in Eugene in order to take advantage of the skill of a certain local surgeon in the repair of sports-injured knees. As part of this, the physician would conduct an operation in an adjacent hospital, and the question was whether or not we could transmit live television coverage from that location to our science auditorium where the group would be meeting. We allowed as to how we could do that, but then proposed further that they should take advantage of the unique potentials of cable transmission offered to them by our PL-3, Channel 7 interconnection. For example, we suggested:

- That each of the rooms, of the 400 enrolling physicians be interconnected to PL-3, so that they could get some "special" services, as noted below:
- A "welcome" message from the Director of the postgraduate course, which would be repeated over and over during the Sunday evening of their arrival. (Another principle is illustrated here: cable casting, unlike other forms of broadcasting, allows for unending repetition, thus providing for a kind of in-depth and saturation coverage which is unique to this form of transmission.)

- A morning wake-up tape, with review of the activities of the day (a la the "Today" show) be transmitted each morning. Which illustrates another principle: that of particularizing the message. What happens with cable transmission is *narrow*casting not *broad*casting, and the difference is very significant indeed.
- Taping, during the day, of outstanding lectures to be played back during the evening for the delight and entertainment of the physicians. We found out what perhaps you already know – that medical doctors are incurable hams, and they love to see themselves perform. In fact, we discovered they preferred to watch themselves on PL-3 than attend the cocktail parties! All of which seems to illustrate another principle – materials on cable TV can be tailored to fit the particular audience, without the conventional fear of what might be happening to the mass audience. Of course this can be done with conventional broadcasting, but it is tough to resist the presures to go for numbers, be it for the FCC or the president of your institution.
- Informal entertainment for members in the form of a laugh riot entitled "Encounter at Wounded Knee," and described thusly:

  > An incisive look at the inside and seamy side of surgery. Hosted by Dr. Robert Larson, and featuring selected guests from the personnel of the course, this program cuts to the bone. It promises to rip the lid off such important medical questions as Is scotch thicker than water? Was Namath bugged in the Bowl game? And, Should a good night cap be prescribed for a bad knee cap?

Well enough preoccupation with knee. Just let me reiterate what I see important about that effort. First, it demonstrated the idea that cable casting is different from broadcasting, and that in the difference can be found some of the real potentials of this form of transmission for education. Second, that this effort demonstrated the value of relationships between the commercial cable and the educational institution. Not only did we serve the medical profession well, but we were instrumental in motivating two of the largest motels in town to wire up to the cable in order to serve their patrons better. Thus, once again, is proven the Bullmoose precept.

## U. OF O. AT THE FAIR

The second example of our experience which seems to demonstrate

some principles involves another project done last summer, known as "U. of O. at the Fair." After it had been decided to establish a booth for the University at the county fair, we were approached by our Office of University Relations. This was the first time the institution had elected to be represented there, and the question was could PL-3 Cable 7 be used in some way to help out in this effort? Once again, we answered that we thought we might be able to do a thing or two for them. The result was that the booth became, in fact, a remote studio, set up with one camera, two portable "Porta pack" units, and a tape replay unit. Included in the gear was a simple switcher which allowed intercutting between tapes and live presentations. In addition, the booth was equipped with a telephone and a video return line so that what was being transmitted could be seen by visitors standing in front of the booth. The studio booth began operation each day of the six days of the fair at 12:00 noon and offered continuous transmissions until 10:00 PM, which was the closing time of the fair.

Through the Office of University Relations, 63 interviews with various faculty members and representatives of the school were scheduled throughout the week, which gave the various disciplines represented a chance to display their wares to a more varied and wider audience than otherwise would have been possible. And perhaps there is a principle worth noting here: You can get the faculty to participate if they think it worth the investment of time and energy. But a simple series of faculty interviews would not have been the thing to attract any kind of an audience, so we used our Porta-pack units to do that. We used these to keep a constant flow of information going to those at home about the progress in such events as the cake bake, the sheep shearing contest, the fire-fighting demonstration, and other homey matters. The principle here is obvious: Video tape can function to capture those moments otherwise lost and which offer a variety to that which you transmit. To put it another way, video tape can help build an audience.

Quite by chance, we discovered still another technique which could help personalize our rather dull and drab institutional message. At one point, we simply ran out of previously recorded tape, and one of our studio interviews was a little late, so in order to get around this problem in programming, we simply turned our studio camera around so that it was looking out of the booth toward the crowd. As we have all noticed when the camera turns on the crows at the football game, it was only moments before we had them waving and gesturing to the camera and to the audience at home. But because of the unique properties of cable, we could do more than what is done at the usual ball game – we would get a kid on camera, interview him about the day's experience at the fair, then pry his telephone number from him. One of the engineers in the booth would then call the number and alert the parent that junior was on PL-3 Cable 7,

live from the fair. There then ensued a period of direct communication between parent and child, which was about as dynamic as anything you've seen on television! The crowning moment came when I reached one mother on the phone, but before I could deliver my message she said, "Would you please call back – I'm watching my daughter on television from the fairgrounds!" All of which illustrates the idea that cable transmission is a local and personal thing, which differs significantly from what characterizes most of broadcasting today.

## SOME GENERAL OBSERVATIONS

In recounting these brief examples of how we do it at old Siwash, I hope certain specific principles have become apparent. At the risk of being redundant, let me reiterate those in some general observations:

- The potential for *real* communication in a cable situation is almost unlimited, even if we are not at the actual "blue sky" stage envisioned by those with the propensity of seeing into the future. The possibilities of direct and immediate communication made possible between the combined use of the television image and the telephone message should be clear to all of us concerned with the future of our institutions.
- Cable transmission may be a way of making it possible for the academic institution to get into touch with its constituency. There may still be some fussy professors who believe that this is not necessary, but I'm not so sure even they haven't begun to realize we need to let others know what our institutions are really like. I am reminded of our "U. of O. at the Fair" encounter with a rather old and conservative member of our Department of Religion. He arrived at the fairgrounds dressed in a double-breasted blue pin-striped suit and maybe even high topped shoes, although that may be a slight exaggeration. But what he brought with him was a display of visuals ranging from models of a buddhist monastery to a collage drawn from *Playboy* which demonstrated the significance of faith in the contemporary world.

And finally, these examples epitomize the effort of the university to function as a community communications device, thus making an institution (which is somehow remote and impersonal from the lives of the majority of the citizens) much more real and perhaps important to everyone.

# CHAPTER 19

# CATV Development at the University of Illinois - a History and an Analysis

**by Donald P. Mullally**

We have all heard how important CATV will be to universities in the coming decade. We at the University of Illinois also believe this to be true, and we have taken some steps to be sure that we will be able to participate in the development of this medium. We are not new to the electronic media; we have been in the broadcasting business since 1922 when we began operating an AM radio station. We went into FM in 1941, and into TV on a VHF channel in 1955. We have learned that the electronic media are expensive, complicated, and very worthwhile. We are now entering the CATV era, and I hope we look back on this period with no regrets.

In this paper, I am going to make three main points: The first is that there is an optimum moment for a university to involve itslef in CATV development. The second is that is is very foolish to get into this business unless you know how you are going to use CATV and how you are going to pay for it—because you *will* pay for it. The third point is that universities have resources which they bring to the relationship with a CATV franchisee, and there are ways of optimizing those resources for bargaining purposes. This is a business in which "getting there is half the fun."

## THE OPTIMUM MOMENT

About 10 years ago, a number of companies tried to interest the cities

of Champaign and Urbana in granting them a CATV franchise. There was a relatively informal examination of the proposals, and it became clear that that was not the optimum moment for the University to participate, or even for a franchise to be granted. It became clear about two years ago that there was another move afoot to develop CATV, and it seemed clearer that this might be the optimum moment for the University to participate if the proposals were good, and if the University could emerge with what it considered essential, and at a reasonable cost.

In my view, the optimum moment for a University to participate is the time of municipal franchising. Make no mistake about it: A CATV operator will not give a university anything special unless there are some very compelling reasons why he should. And the university's demands must be in keeping with financial reality. The second best time for participation is at the renewal of a local franchise. The worst time, in my view, is sometime in the middle of a franchise period.

When the cities of Champaign and Urbana began to move ahead on CATV, they invited the University to place a member on the local CATV committee–two members from each city council and one from the University, which is the largest industry in both communities. I was that representative. One of the University's great resources is information–about virtually anything. Thus, when the local CATV committee members lacked information about CATV capabilities or industry finances, or consultants, we were able to provide that information. It soon became clear to city officials that their system would be much better if the University were to participate, and serve as a program source and a cultural resource for the whole community. But they felt–and justly so–that the University should pay its own way and not increase the cost of the total system to townspeople. This was a very difficult and delicate relationship: We were faced with the necessity of guiding the cities, helping them, yet not dominating them or manipulating them. Above all, we had to stay out of the political processes and appear as the corporate good citizen.

Finally, it was determined that in asking companies to submit proposals to the cities, one of the criteria for judging–announced in advance–was what the companies could offer to the University of Illinois, and at what cost. Finally, it was decided that one of the criteria for judging proposals submitted to the cities – announced in advance – was what the companies *would* offer. As a result the University retained the right not to participate or to issue its own franchise. If it were to participate, its relationship to the franchisee would be governed by a *contract,* and the major investment of dollars, talent, and University resources.

## PLANNING FOR DEVELOPMENT

The only reason why a university should get involved with CATV is that this medium might make it possible to do something which could not be done at a reasonable cost by some other means—something that is important, and a part of the university's functions. Once you come to this general conclusion, you must, it seems to me, make some tentative determinations about what you would do with CATV if you had it. We studied the matter for some time, and I ultimately produced an incomplete five-page summary of what we might do with it (see Appendix A). I'll supply a copy of this to anyone who is interested.

This list included a number of educational uses of CATV, as well as a number of administrative uses, such as the interconnection of computers, library uses, and inventory control. Some of these things we are doing right now, others are things we really would like to try. We have a closed circuit system which goes into several classroom buildings. But what would happen if we could reach students right in their dormitory rooms or their apartments off-campus? Suppose we could present lecture material dozens of times a day so that students could watch the lecture as many times as they wanted, when they were in the mood for chemistry or mathematics or philosophy?

Some uses are innovative, some are pedestrian. But if you analyze those uses which are part of your current operation, you can see that communication now costs you something. Let me give you an example: We now lease cables from the telephone company to carry our closed circuit TV signals. That costs money. We now use a University-owned cable to carry fire alarm and burglar alarm signals. That cable is more than 50 years old, and will soon have to be replaced at a cost of over a quarter of a million dollars. Adding up these costs, we discovered that we could save $56,000 a year if these functions were absorbed by CATV.

If the University were to charge its housing division $1 per month per dormitory resident, it would generate more than $100,000 per year in cash. The students would not be charged directly—the cost would be built into their rent. Thus, the maximum target figure for the University's costs for CATV were determined in advance to be about $156,000 per year. Could we build, staff, and maintain our own system for that, and get the same advantages? Absolutely not; we studied the question extensively.

Would a franchisee deliver service to the campus the kinds of sophisticated services we had in mind for the amount of money we were willing to pay? We put an accounting team to work on the problem, and decided that on a dollar basis alone, it was very tenuous. Thus, the University had to discover other resources. Here are some of them:

*Program material:* Educational and cultural material which we might put

on the city cable would have value in attracting subscribers. If we were to put classes on the cable for students to watch in off-campus housing, those students would wind up as subscribers at the regular city rate. Our other programs would be unique, something not available anywhere else.

*Bulk Billing:* If the University were to pay a specific sum for the construction and operation of its campus system, this would be a guaranteed income for a long period of time, with no non-payment problems and minimal billing expense: not 20,000 individual bills to generate $100,000 in revenue, with some of them unpaid but *one* bill, with the credit rating of a university behind it. (I sometimes wonder if that last part is an advantage, in these times of tight budgets.)

on the basis of what they have already done. Here was a chance for some company to work with a university that knew where it was going, which had a background in the media, which had the resources to develop the educational potential of CATV, and which was willing to serve as a testbed for some technological innovation. That was worth something.

Well, there were many other things. We studied and inventoried our resources very carefully, and decided that we could make it worthwhile to a company, even on non-dollar terms. We then invited all the prospective bidders—nine of them—to visit the campus. We gave them a tour so they would know what they were bidding on. We told them of our plans, and we told them we had studied *their* financial background, and we knew what it would cost *them* to do the job.

Some weeks later, I wrote to each of the companies and told them what kind of package would be required to make their bid both attractive to the University and successful in view of the expected quality of the proposals from competing companies. In every case, this was *more* than I thought they were prepared to offer.

My point is that we knew what we wanted to do with CATV and how much we were willing to pay to do it. Then we presented our resources at the moment when they were of optimum value—the time when municipal franchises were being awarded. The companies knew that without the participation of the University of Illinois, the franchise for Champaign-Urbana was devalued by at least one-half, and possibly the cities would not even grant a franchise to any company.

## THE RESULTS

When the bids came in, we discovered that companies have a wide range of levels of sophistication in dealing with universities. I suspect the opposite is also true. One of the proposals was satisfactory in every way to the University of Illinois, although there were others we could have lived with. As it happened, the Joint Champaign-Urbana CATV Committee also liked the same proposal best, and a franchise was *tentatively* granted to

that company, I say "tentatively," because there was a clause in the franchise ordinance which allowed revocation if the company did not reach a contractual agreement with the University within a certain length of time.

Let me make one thing very clear—a franchise application or proposal is a sales document, and the team that comes to the community to deal with the local people are salespeople whose job is to sell. The sales document is written in loose terms, and there is no provision for enforcement. Thus, we went to a good deal of trouble to write a contract which contained the provisions we saw as essential. Even though the basic provisions were in the company's franchise application, it took us *months* to negotiate a contract. I wrote and negotiated that contract, and I must tell you that it was an extremely difficult and trying negotiation. I think our campus legal counsel and the University General Counsel aged at least 10 years during that negotiation process.

Finally, we reached agreement, and our relationship changed from an adversary relationship to one of mutual cooperation in carrying out the terms of this contract for our mutual benefit.

Let me conclude by summarizing some of the items in that contract:

1. The company will completely wire the campus with a two-cable system with two-way capability from every outlet.

2. The cable will go to the utility area of every classroom building, laboratories, administrative buildings—in all, virtually all of the more than 400 buildings on our campus.

3. Every one of our more than 5,400 dormitory rooms and married student apartments will be wired.

4. The company will construct, equip, and maintain a television studio and radio studio, and will keep them state-of-the-art for the life of the contract. These studios are for the use of the University in preparing educational materials and in training students in the electronic media.

5. The capacity of the campus system will be at least 24 video channels and dozens of data and audio channels to begin, and will be expandable in the future.

6. The system will be maintained to a specific technical standard, and all maintenance will be performed by the company. There is a penalty provision for down-time.

7. All signals carried on the city systems will be available on the campus system.

8. The company will provide a $500 scholarship for a student in communications.

9. The University system is interconnectable with the city system, and the University's payment includes the lease of three channels on both city systems.

10. The University has the use of reverse-direction capacity on the

city systems for the relay of TV and radio signals from remote points to our own broadcast and CATV facilities.

11. The total cost to the University, for construction, operation, and maintenance is the fixed sum of $100,000 per year. The contract is for 15 years, and there is no payment until a substantial part of both the city systems and the University system is complete.

I think there is one final question: Will we be able to utilize the system wisely and well? We are willing to bet the sum of almost a million and a half dollars that we will. A team of engineers, lawyers, accountants, and many others has worked to devise a contract with a reputable company that will be in the best interests of the University of Illinois and will make us leaders in this field. There is a substantial commitment from our administration. But in the long run, everything depends on the faculty. But that's another topic. Getting there has been half the fun.

The answer is CATV. What is the question? If you don't know that, you're not ready for CATV yet.

# CHAPTER 20

# What the Federal Regulations Really Say

**by Frank W. Norwood**

Obviously, the study of the Federal Communications Commissions Rules and Regulations would take more space than we have here, but if you, as university people are to look at the university as a potential resource within your community for dealing with cable television, you will have to recognize that you have your campus people who are skilled in communications, sociology, in political science, in law (certainly if you have no law school you have people who are knowledgeable and concerned about the law), and that you represent an intellectual resource to which the community should be invited to turn. You represent a nexus which can provide a center for community interests to come together so that you find yourselves all planning cooperatively, preferably with the potential operators of the cable systems rather than in opposition to them, and still more importantly, in cooperation with other educational agencies–the schools, the libraries, the other colleges, the medical schools–whatever the educational community of your particular domain may be.

If you look upon yourselves as the natural body to take up that role, then what you need to do is to take the intellectual resources that you have and apply them to the problem at hand. In order to do that, your lawyers and your economists had better become familiar with what the

realities, economic, legal and otherwise, of cable television are. That's why I suggest two issues of the *Federal Register*[1] as basic reading. Let me take a few minutes to suggest one way in which the study of reality is much more useful than an academic debate:

There is a widespread rumor across the land which I want to do my best to put to death here. You will be told by cable system operators, and you may be told by staff people at the Federal Communications Commission, that these regulations say that you may have in new systems constructed in the top one hundred markets one free channel for education, and that that is true for the next five years. The rules say that at the end of five years, existing systems have to update themselves to conform with these regulations; but they also say that that education assignment is for a matter of five years—and the Commission, in its own words, "will revisit this question later". Thus, the FCC may decide at the end of five years that *nobody* needs to provide an educational channel. The decision is likely very much to be based upon what our performance is. Moreover, the rules say that each new system is to provide a free channel for education for five years from the time it begins operating, so that systems that begin operating in Metropolisville on February 1, 1974, count the five years from *then*, so there's no sharp cutoff date—it will vary.

## ONE FREE CHANNEL FOR EDUCATION

The other point that needs clarification is that the FCC requirement of one free channel for education represents a minimum established by the Commission. No system may refuse to do that; its mandated by federal regulation. It does not preclude the possibility that other channels may be made available either as a part of wheeling and dealing between the educational community and the operator, as a part of the city franchise, or whater. But both the rules and subsequent FCC actions and words make clear that we all get one free channel (and not *us*, the university, or *them*—the schools—but all of us in the educational community, however we may define that in our own particular circumstances) on the basis of our good looks, our pious promises, and the fact that organizations like the Joint Council on Educational Telecommunications cried that, after all, we had channels in broadcast television and in broadcast FM, and we ought to have an opportunity for a piece of the action in this new technology. Beyond that channel, it's quite clear that the burden of proof, friends, is upon us.

Before any new cable system can begin operation, the terms of the local franchise must be reviewed by the FCC which checks them to be sure that they are in conformity with the federal principle and, if they are, the Commission issues a Certificate of Compliance. Local franchises which fail

to provide a channel for education would likely be denied such a certificate. By the same token, provision of more than one channel for education would also represent a variation from the norm, and the Commission has made clear that it will scrutinize such proposals to make sure that there are adequate plans to make timely use of such additional channels, and that the provision of additional channels will not represent an undue burden on the system as a whole. I point out to you that a commercially operated cable system or even a municipally or university operated cable system which constantly operates in the red will eventually go out of business, and all the channels in the world on a system that no longer operated are of small value. There's an example in Lakewood, Ohio, where you can have all the channels you want, but unfortunately no one is connected to the system anymore, so we do need to give consideration to the realities.

Those plans for multiple channels for education are going to have to be spelled out in some kind of reasonable detail. The Commission has taken at least two actions that are significant in this regard and which you ought to know about when you are told that one channel is a maximum. The first is a letter dated August 22, 1972, from Sol Schildhause who was, until very recently, the chief of the Cable Television Bureau. In a question and answer format, Sol wrote in reply to an inquiry from a cable operator, Western Communications Inc.:

> *Question No.5:* Can a franchising authority require all access services to be made available at no charge?
>
> *Answer: No.* [And ordinarily the people you talk to will end the quotation there, but it goes on to say,] The Commission will consider in its certification process, however, requirements that additional public-access channels or some additional educational channels be offered at no charge or at reduced cost on an experimental basis. See Paragraph 132 of the Cable Report and Order.
>
> *Question No. 6.* Can a franchising authority require a franchisee make available more access channels than those specified by the Commission? The answer is "No"—unless during the certificating process, the Commission is shown that such additional channels are necessary and capable of being used according to an existing viable plan.

There was a long period of time between the issuance of those cable rules in early 1972, Sol Schildhause's letter in August of the same year, and any evidence that the FCC really would permit more than one channel for education. Almost a year went by when, if you asked the FCC staff if any Certificate of Compliance had been granted for a cable system which promised to privide, or was required to provide, more than one free channel for education, you would be told "no". And the industry and some people in government would say, "There, you see; that proves the

point. The FCC never issued a single one." But a more important and significant question was "Have you denied any?" and the answer to that was also "no". Because under a tremendous bureaucratic backlong, the Commission, which had no such animal as a Certificate of Compliance until the March rules became effective in '72, suddenly had an enormous roomful of applications for these new FCC certificates, and as any sensible people would do, they processed first those that were clear and simple *pro forma* arrangements. So every time the Commission staff—the Cable Bureau staff—came to anything that was different from the cut-and-dried 1-2-3 process, they put it aside("That's a tough one, it'll take us an hour to get through that; in the same time we could process ten of these stamp-it-and-move-it-on kind.").

## THE NEED FOR VIABLE PLANS

In August of last year, the Commission did grant a Certificate of Compliance to some cable systems operated by ThetaCable of California, which is a major operator and is, in fact, a joint venture between TelePrompTer, the largest of multiple-system operators, and ThetaCom, which is a wholly owned subsidiary of Hughes Aircraft. In Ontario, Upland, portions of San Bernadino County, and Montclair, California, Certificates of Compliance was granted for systems to provide four free channels for education. What they did was to provide a single access channel to be shared among all of the communities and use the extra channels available for education. The FCC announcement included this significant sentence: "The Commission noted that Theta could comply fully with the access rules if it ordered less educational and more public-access channels but said it was reluctant to substitute its judgment for that of the interested parties." And I want to repeat that—the Commission is on record as being reluctant to substitute its judgment in Washington, D.C. for that of the interested parties.

So I suggest that one of the things you ought to do as the intellectual resource in your community is to make the community mindful of the fact that if viable plans such as those Roger Fransecky discussed in his paper can be developed in your area, you are not likely to have difficulty with the FCC. In fact, if you do, you have very good reason to appeal any negative preliminary decisions and to cite the precedents that I've been talking about.

Cable Television and the University

# PART V

# CHAPTER 21

# Academic Change, Multi-Media Education and the Role of Cable

**by Jessie C. Hartline**

At a conference organized around the theme of Cable and the University, institutional organization and administration must be discussed in relation to change in higher education.

Academic administrators planning for the future and probably for change must ask the important question "Why?" It must be understood that goals must come before structure. This is so very important because we are moving in many ways toward the question of survival, not only of programs, but of institutions of higher education themselves. Innovation, multi-media use of film, cable, computers, cannot be ends in themselves, but must be used by institutions to move with integrity toward educational objectives.

Goals, identity, and mission in colleges and universities must first be established. The accrediting associations themselves are becoming less involved in toting up items such as faculty credentials, degrees granted, or library volumes and are more and more seeking to determine whether the institution is effectively meeting the goals it has established for itself. Colleges and universities should first establish their own missions and ask why they are as they are, or want to be. We are past the point in higher education when we can say that we can be all things to all people. There has been work done in this area to help instituitons with identity

problems, such as the work prepared and published by the staff of Educational Testing Service, and increasingly institutions of higher learning are using questionnaires and other institutional research methods to establish goals and priorities.

## A PROGRAM FOR CHANGE

What might a program for change involve? It first has to involve the faculty, administration, students, and alumni. I offer as a case study, the Rutgers University College experience over the past several years.

Part of the charge to Rutgers University College is to offer high quality, part-time, adult liberal arts degree programs. New Jersey is the most densely populated state in the U.S. and has historically exported approximately 100,000 students each year. University College, which has five centers in major cities of the state, saw an opportunity not only to serve more students with our offerings in non-traditional ways, but to do so with the high quality faculty and academic resources we felt we had.

We had the prospect of planning ahead for the utilization of a statewide public television network as well as computer network. In addition, we had a small closed-circuit television network that linked buildings on our New Brunswick campus.

When we found a distinct lack of software, or courseware, ourselves to take maximum advantage of the facilities. We found what all of you already know – that course preparation and multi-media production are extraordinarily expensive. Having investigated the situation, we intended to use television for its video characteristics, audio presentations for their flexibility in delivering lectures or panels, and face-to-face meetings for interaction of students and faculty.

The plan was grand but entirely too expensive for us to begin *de novo.* It was a no-go situation without sufficient funding. We then tried to investigate all that already existed and saw that there were a lot of multi-media materials available, but ones that were fragmented and uneven in quality. Moreover, it was impossible to get information that faculty needed about the appropriateness and quality of materials. More information should be published about the media-developed courseware, and preferably in professional journals where faculty will see it. Along with that there should be critiques and evaluation of multi-media courseware established, since academics do not have the time, patience, or inclination to review and delve through the materials individually. This was a problem when we began and it is still a problem today.

During this planning time 3 years ago, our research and discussions brought us to the Open University of Great Britain. The criteria we had set for ourselves apparently had been met. The programs developed had met the standards of boards of outside examiners of scholars from institutions

such as Oxford, Edinborough, and Cambridge, and when we brought the books, films, and tapes to the campus, we were strongly encouraged by the reviews of the programs.

There really is not much new in the elements of the Open University. The disciplines themselves are traditional. The interdisciplinary nature of the materials has been accomplished very successfully. The packaging is really what is of greatest interest. They have put together print, television, radio, and student-faculty interaction in study centers throughout the country. Independent work on the student's part is a prime ingredient in the Open University. In the United States, study programs have always been available to the highly motivated, the honors student, upper division and graduate student. These students have accepted independent study very easily. Because of the flexibility of study times that the courses offered, it was felt that motivated adults could take advantage of this aspect of the educational process very well.

I must add that these materials are not only highly respected academically but are very demanding. In Great Britain, it is estimated that 10 to 12 hours of home study are required each week. Our students are averaging from 13 to 20 hours for a week's assignment. Once can see that the courseware was not intended for any other than the highly motivated, able student who because of responsibilities or inclination cannot, or prefers not to, attend regularly scheduled classes.

My own feeling is that those involved in non-traditional education should develop programs that are of *at least* as high quality academically as traditional offerings. Lady Jenny Lee, who has been a staunch promoter of the British Open University, summed it up at the ceremony dedicating the Open University library to her in Bletchley, London last April, saying in part that the Open University is well considered the university of the second chance but it can't be a university that is second rate, for then the people whom it was designed to serve, will have been cheated twice. With the highly mobile population and the frequent transferring of students to different institutions, acceptability and common currency of credits all over the United States are of great importance to us.

## A NATIONAL EXPERIMENT

For all of these reasons, the British Open University courses potentially fit the mission of our institution. We therefore went ahead in May, 1972 with a proposal and joined with the University of Houston and the University of Maryland as part of a national experiment. We had an outside evaluator for our first year. Since evaluation is vital for programs of educational change and innovation, we were able to get funding from Carnegie through the College Entrance Examination Board to have Educational Testing Service conduct an outside evaluation of this

experimental program.

Rutgers University College proceeded to offer three of the courses: humanities, mathematics, and science, each of which carries 15 credits. The evaluation report of the first year is scheduled to be released by ETS in late spring of 1974.

Four years ago, when we began, we formed an ad hoc committee on non-traditional study consisting of faculty and outside scholars to review courses for academic integrity. This committee came back with a generally favorable report on the three programs that were ultimately accepted. The report went through the usual channels of our institution, which has committees on courses of study and academic policies, and then finally through the faculty as a whole. We felt that this process was important not only for academic input but also to give the faculty a feeling of being part of the process for change. We also needed an academic evaluation. The same standards were used to determine academic credits for these courses as for any other courses. Each course was evaluated at 15 credits. (In Great Britain, 8 credits or units are needed for a degree, and we require 120 credits, so 120 divided by 8 gives a 15-credit equivalency.)

We met with representatives of other undergraduate colleges within Rutgers University and explained our program so that students would have the possibility of transferring their OU credits to the traditional programs if they chose. We hoped to take care of some of the students' problems before they arose. There was cooperation and interest on the part of the other undergraduate colleges and through the experimental year there were not only visiting scholars invited from the British Open University but also professors from other units of the University who came in to give talks and demonstrations for our students.

The review process for institutionalizing the experimental program is now going on. The second year has seen an additional course in the humanities added, and we trust additional courses may be added in the future. There is also a willingness in some departments to review materials developed by other institutions in the U.S.

An important issue concerning non-traditional education that has often been debated is whether a new institution must be formed to develop and implement non-traditional educational programs. With a newly formed institution faculty can be recruited specifically for the purpose and make a fresh start. Their enthusiasm can grow rapidly, unhampered by engrained governance procedures. And yet, there are disadvantages as well. After having been involved in the processes for four years, my feeling is that in order to have new kinds of education accepted generally, established traditional institutions should participate at some levels. It is going to take longer for new institutions to establish acceptance and credibility alone. We do not have a minister of culture in the United States who can support and fund millions of dollars for any one program

or institution as in the Open University of Great Britain. However, if the established, accredited colleges and universities who cooperate and/or put their stamp of approval on new programs and delivery systems, I think the leader institutions will have a chance to help the movement grow. There is room for all, and I would not discourage new institutions, but I would not insist that forming new institutions is the only way, or even the best way, to accomplish change or innovation. In the move toward non-traditional education, cooperation of established institutions seems to me to be vital because without it, such institutions can be very powerful enemies and it is the student who loses.

There are a great many social and demographic reasons why change may very well be inevitable: the increasing phenomenon of delayed college entrance and junior-year "stop-out," predicted birth rates, "less time-more options" predicted by the Carnegie and Newman reports and emphasis on non-traditional students such as housewwives, veterans, the aged, and the institutionalized, so that it has at long last become more acceptable to reach the educational needs of these people. Further, it would seem that there will be continued change in the attitudes of the students themselves that will make a difference. The television generation is now in college, and the *Sesame Street* and *The Electric Company* group are not likely to go away.

There are changes going on right now in K – 12 education. Students are doing reports using film, radio, slides, and skit presentattions in school systems not considered not to be experimental or even very progressive. These students may not feel so comfortable sitting in hard chairs in a classroom with a professor, chalk, and blackboard for four straight years after having this kind of freedom to learn for their first 13 years. These students may very well expect and demand changes.

As an aside, I am pleased that the Graduate School of Education at Rutgers has reviewed the Open University materials in mathematics and science and is awarding nine graduate credits for each of them towards a master's degree and teacher certification. Their feeling is that these courses are academically excellent as well as being interdisciplinary in nature. Moreover, they believe in the adage that we teach as we have been taught. The importance of teacher education should not be lost sight of in this whole movement which is going to require their help.

Recruiting faculty is much discussed. In our case, we did not recruit new faculty, but invited existing faculty of the traditional college program to join in. Because of the general awareness of the program among the faculty, several came forward and asked to be involved in it. The amount of work that is required to mount a program such as this is far more than mere money can buy. The sense of commitment must be there. Unfortunately, non-traditional education is too often taken on by faculty on an overload basis. This form of staffing should be avoided. But it is

evident that a student-oriented faculty is important to the success of the program.

Obviously, funding is of paramount importance. Non-traditional programs that depend on continued grants have no future, nor should they. Legitimate programs have ongoing institutional funding. Someone has said that funding on an FTE (full-time equivalency) basis must be done away with. I agree with this, but until that day, an acceptable substitute formula base must be developed. The FTE base reflected the amount of time a professor is in the classroom. In non-traditional programs, the professor may not spend any time in the usual classroom, but a great deal more time with students and more time developing courses. Some of the instruction that might be considered similar in nature to non-traditional programs are studio art, drama, athletics, and academic counseling and tutoring for the educationally disadvantaged. Funding arrangements for these kinds of activities can be explored and mechanisms developed. As cost-effectiveness is further researched and refined, it may be that multi-media education will become more attractive to administrators at all levels. Multi-media programs are generally characterized as capital intensive. Relatively high initial, or sunk or fixed costs can be borne as larger numbers of students are enrolled and marginal costs decrease. Thus, long-term budgeting and planning are necessary.

Having considered these many factors, goals and plans were set and the options of a delivery system explored. During the experimental phase, films and audio tapes were available to students in study centers.

In the British Open University program, print is the most important medium used. Approximately 80% of the information and instruction is transmitted to students through workbooks, texts, and outside reading materials. Each week, the BBC airs one-half hour radio programs that may be a lecture, discussion group, or lesson review taking maximum advantage of the flexibility of radio. The audio-visual portion is a one-half hour broadcast on public television, BBC 2, taking the viewer inside a nuclear reactor, to a scene from *Hamlet* by the Old Vic, or looking at math functions as applied to marine design.

Having been involved with public television myself, I first explored what arrangements might be made for the use of public telecasts in our area. Public television people were very cooperative in discussing availability of broadcast time. However, thinking through the ramifications of presenting the programs to a potentially vast audience, it did not seem certain that printed supporting materials would be available in sufficient numbers. We knew also that many people might want supporting materials even though not enrolled as students. In addition, it was possible that the potential number of students might be so large that I would not be able to guarantee the professorial staffing or sufficient study centers. Moreover, though produced by the BBC, the films are primarily in black and white

which presented a problem. Unfortunately, the visual quality of the 16mm films available is uneven due to the fact that they are dubbed from 2-inch video tape, and the resolution is not what many are generally accustomed to on public broadcast. Under the circumstances and constraints with which we were operating, we were not yet ready for public broadcasting. It should be added that there was the additional problem of communicating the radio portions to the same audience receiving the telecasts.

## A GOOD MARKET FOR CABLE

However, the situation with regard to the use of cable is more promising, especially as we thought more about our student market. The materials are for the highly motivated student. There are no entrance requirements for the program, but we do require that each student enrolling have an interview with a faculty member so that he fully understands what the program is about and what will be expected of him. The University College faculty has set a policy that any student successfully completing a course in the program is automatically admitted to the regular part-time degree program if he chooses to continue in the College.

As we realized more precisely the nature and appeal of our program, the use of cable gave the opportunity to know exactly who the audience was through the subscriber list. To illustrate this, we have had discussions with one of the small cable firms in New Jersey which was very cooperative. The socioeconomic characteristics of the subscribers in the area indicated that they would be an interesting potential student market for the courses we were offering. We and the cable firm did a cooperative market survey of the approximately 1,800 subscribers. A letter was sent out with a postcard to be returned by the subscriber who either (1) was interested in viewing the programs without becoming a student or (2) wanted to take the courses for credit and was willing and able to pay for the tuition and books (approximately $360). There was a 2% return of subscribers who responded to category (2) and who requested to arrange an interview and enroll. Two percent of the audience was too small in relation to the necessary expenses for royalties and the like, but such a percentage of a larger base is not too small and could be economically feasible as subscriptions grow.

The possibility of pay cable for funding educational programs offers real opportunities for the future. With the inadequate financial aid available, a pay-as-you-go system may be workable and advantageous.

Another advantage is two-way communications. At this time we are talking about students reacting to materials by postcard and telephone after seeing the television programs but there is the future possibility of

technology developed through the "black box."

There is also the advantage of the use of low-cost production in cable programming. This is an important and legitimate aspect for the future of multi-media education via cable. There are short courses, current interest topics, and highly selective programs that would not be economically feasible to produce for wide-audience public broadcast but would be very appropriate for cable subscribers.

Video broadcast into homes or institutions is not just delivering education differently to the same kinds of clients as in the past but is reaching a new student body. We have lost students who were unable to come to the study centers regularly for various reasons such as transportation problems, physical handicaps, work, or personal responsibilities who would have been better served if they had been reached in or near their homes. At present, with cable, programs could be rebroadcast more than once a week and also could transmit the audio portions of the courses as well.

We feel that it's important to provide a study center as part of the facilities so that students can have consultations with professors, student interaction can take place, and students can review films or tapes according to their needs.

## A NEED FOR MISSIONARIES

To sum up, all the developments that have and are taking place must be viewed as increased options for students and potential students that we have not been serving at all or have not been serving as well as we might. Education should take many forms. The form it takes depends on the "know thyself" principle. Each institution can think through its individual mission. Leaders in the administration, faculty, students, and alumni can explore their options and come together to bring quality and options to the students they feel most able to serve and do it enthusiastically.

The public at large does not really understand non-traditional education. We educators, traditional and non-traditional alike, who spend so much time talking to each other are going to have to talk to the public and let them know what is available, and make available what they need and want. There's a great deal of missionary work to be done.

And finally, to come full circle, we are going to have to ask ourselves "Why?" at every turn. Why change? Why non-traditional? Why audio-visual? Why cable? Why classroom? Hard-headed answers to these questions will give us the who, what, when, and where of the future.

# CHAPTER 22

# Cable Television in Palo Alto and at Stanford University

**by Edwin B. Parker**

In June, 1973, the Palo Alto Citizens' Advisory Committee completed its report, "Cable Television in Palo Alto." The committee recommended a municipally-owed cable television system with the operation delegated to a non-profit corporation established by the municipality. Palo Alto has a good history of municipally-owned utilities; it manages to operate its municipal utilities at a profit while still charging rates less than Pacific Gas and Electric charges in the surrounding communities. The proposed technical system is a three-cable, two-way system with the amplifiers on the third cable in the reverse direction in order to develop two-way capability. The recommendation includes an eight-item cable "bill of rights" including clauses saying there should be no censorship, providing for protection of privacy, providing for equal opportunity of access both to the sending and the receiving ends of the cable, and so on.

After being reviewed by the City Council Finance Committe, it was referred to the City Council in mid-March. The decision was not a definitive one (either go or no-go) with respect to cable, but was a continuation of their cautious, deliberative, careful planning. The city manager was requested to report back to the council concerning cable television in a year's time.

It appears that either of two conditions would have to be met before cable is constructed in Palo Alto. The most significant would be a strong

demand from Palo Alto citizens. The other would be clear indication that cable would be profitable in Palo Alto. The plans are still to proceed with a municipally owned cable system when the time comes, rather than award a commercial franchise. The staff report in the spring of 1975 will permit the council to reassess whether the time is right.

The committee report recommended that the system be designed for compatibility with neighboring communities, including Stanford University. The recommendation for the relationship with Stanford is as follows:

> A Palo Alto cable system could also serve the unincorporated areas of Santa Clara County owned by Stanford University. Alternately, if Stanford decides to have a cable system of its own covering all or part of the Stanford campus, then the Palo Alto system could be interconnected with such a Stanford system. Either arrangement would be to the advantage of Palo Alto because additional programming material originated by or for Stanford University could then be made available to Palo Alto residents, enriching the variety of content that would otherwise be available. If Stanford develops an experimental cable system compatible with the Palo Alto system, the interconnection between the two systems should permit sharing of programming, but should also permit disconnection of the two systems so that any technical experiments conducted by Stanford would not risk degradation of quality of the Palo Alto system. Should Stanford conclude a program of cable television experimentation, then arrangements to incorporate the Stanford system into the Palo Alto system for operational service could be discussed by Palo Alto and Stanford.

## PLANS FOR CABLE AT STANFORD

At Stanford we have an advisory committee to the President that was set up to recommend Stanford University policies, regarding CATV and to provide liaison with the Palo Alto group. The activities of that committee have included arranging to have the President of Stanford write to Santa Clara County (which is our franchising authority since we are in an unincorporated area of the County) to request that they don't award a franchise without consulting Stanford. The committee also has submitted opinions to the Federal Communication Commission commenting on proposed regulations.

Most importantly, the committee has been discussing ideas for a possible experimental cable system on the Stanford campus. Thanks to some financial support from the Sloan Foundation, we have, as part of general Stanford discussion and planning, been working out plans for an experimental cable system. These plans are still being discussed, but it is

my hope that before long, a proposal will emerge to find outside funding for an experimental program. Whether or not it is done at Stanford is less important than getting on with the program of experimentation somewhere.

An activity at Stanford that has set an interesting precedent with respect to University involvement in software development has emerged from our four-channel television ITFS (Instructional Television Fixed Service). That ITFS system which is run by our engineering school, has four channels of television, an audio feedback link from each remote viewing location, and is used primarily for credit courses in graduate engineering. This is a low-budget operation without any production. A regular classroom lecture is transmitted by television to the remote locations. I won't comment on the quality of instruction; it's essentially the same as untelevised lectures. A commercial entrepreneur decided that there was a market for the information that was contained in those lectures, and so an arrangement was made whereby the camera operator (who was there anyway) would turn on a video tape recorder at the start of the lecture and turn it off again at the end. Those taped courses were then sold with a royalty arrangement similar to book publishing: Fifteen percent of the gross sales were allocated for royalties. Those royalties were then split, half to the institution and half of the faculty member. This sharing of royalties with the university differs from book publishing. When writing for print media the professor can go home and write his book on his own time with his own facilities and then make his private arrangements with the publisher. In videopublishing, the video recording equipment and facilities are part of the university's institutional arrangements. Hence for the additional sale beyond the service to the students who are registered at Stanford, the royalties were split between the faculty member and the educational institution.

## EQUAL ACCESS TO EDUCATION

In discussing cable television and higher education we should make clear what social goal we are attempting to achieve. My goal is improved economic productivity in higher education, and I don't think that means saving money. It means that for the community at large, we may be able to find a way to use new communication technology to meet some of the social goals that some of us have been articulating for some time—namely, equal opportunity of access to education. I think every member of this society ought to have access to the educational opportunities of the society, and by every member I don't mean just the young, just the males, just the rich, or just the most intelligent. Every person ought to have opportunity of access through a whole lifetime. The reason we haven't been providing that kind of an educational service is that our present

means, our labor-intensive educational activity, makes it physically and economically impossible. We'd need to have at least twice as many people as we have in the population to be teachers in order to teach everybody. But I'm hoping that the new technology will make it possible to bring down the unit costs of education to where it can be made accessible to everybody. That is a more important goal than saving money in our existing institutions.

When we are looking at this kind of goal for the society, we ought not to say "Here's cable television or here's this tool or here's this axe, what can we chop with it?" We ought to look at what are our social goals and how we can control and use our communication technologies to accomplish them. So we ought to look carefully not at cable in isolation from other technologies, but at videocassettes, communication satellites, computer systems, and of course cable, one-way and two-way, to see how we can fit the pieces together. I think we can analytically separate the problems into at least two different categories, production and distribution.

We need to devise ways to develop a videopublishing industry or a videopublishing activity in higher education to make the appropriate instructional content generally available. And we need to have economical means for the distribution of that content. Cable is one way of local distribution. Communication satellites are looking like they'll be the most economical basis for national distribution. Some of us have been working on a study of the economics of satellite distribution of video materials, and it is beginning to look like within a few years it will be cheaper to distribute by satellite than to 'bicycle' videotapes around. Present means of distribution require a stock of tapes at each location and a fairly complex organization with administrative costs and procedural arrangements (and inevitable foul-ups). Given the tape inventory costs and the administrative costs, it may well be that within a few years the satellite distribution costs will be cheaper.

As we work toward this social goal of equal opportunity of access to education, there are many unknowns. Probably the greatest of these is the blue-sky area of two-way cable, a communication medium that doesn't yet exist. It was more than 10 years after one-way television was generally available in the society before there were any truly exciting instructional uses of that medium. We don't even know for sure what two-way television will be like, let alone how to devise an appropriate technique for communicating effectively through it. There is a great need for a program of experimentation to try and better understand how that kind of technology can best be used. I'd like to see at least one and preferably several national facilities for experimentation. It's much too early to say which kind of system will make economic sense for any given institution; it may never make economic sense for any existing institution because the

scale may be wrong. If we're trying to reach out to much larger student populations than our present institutions are now serving, there probably will have to be major rearrangements of institutions. I'd like to see four major areas of research and study within a national two-way cable television experimental facility for education.

## FOUR MAJOR AREAS OF RESEARCH

The first of these is policy and economic research. The research should look not at the economics of the experiment itself because we know that that is too costly to justify on a per-student basis. Rather it should look at what the economics might be if projected onto a more appropriate national scale. Such a program of economic and policy research ought to be important in deciding which specific experiments should be conducted. A policy and economics research group should look at the results of the particular experiments and try to generalize or extrapolate back to the national scene. We should look not at what cable can do for Stanford, for the University of California, for Rutgers or any specific previously existing institution, but what implications this has for national educational policy.

A second research area is instructional research. I'd like to see a program of development and experimentation built upon incorporating research techniques into the development of curricula that are appropriate to either one-way or two-way cable systems. We may find that we don't really need cable after all, that it can work just as well if we videotape the material and put the content in storefront learning centers with video modules and create a supporting structure of advisors and consultants. I don't want to predict that cable, one-way or two-way, is necessarily the way to go, but I think it is one of the possibilities for local distribution that needs to be seriously explored and so I'd like to see it as part of the experimental facility.

A third area of study that is very important is non-formal learning. Much less than half of what students learn on university campuses comes out of what they learn in their courses. Universities are culturally rich environments where people can come to learn, expose themselves to opportunities, to participate in group activities, structured and unstructured, with other people. People who get their instruction only through some communication medium like cable, that might focus only on course content would be deprived of much of the value of educational institutions. We need an innovative program in use of the cable to get some of the cultural richness of the universities on the cable system: student television stations' use of cable with drama, with music, with sports, with student political discussions–the whole range of non-formal instruction possibilities.

The fourth area that is extremely important is experimentation with data communication. Experiments could try to work out how cable might be used as a local distribution system for computer networks so that computer-aided instruction, access to computing resources, access to library resources through information-retrieval techniques, and so on, can be used. How can we put the PLATO system or the Mitre system, or whatever other access to computer or computer-controlled resources on the cable? How can they be made available to individual students, either at homes or storefront learning centers through using two-way cable for data communication? There is a lot that needs to be done, both in social and technical experimentation, in trying to work out some of the answers.

## THE NEED FOR EXPERIMENTATION

There is much that we don't know about how to use cable effectively for education, especially two-way cable. Therefore, in addition to whatever operational uses are proposed, I urge that a program of careful technical and social experimentation be included in any national plan for the use of cable television for higher education.

# CHAPTER 23

# State Systems Planning and the Potential Application of Cable Television in the Development of New Institutions

**by Gerald C. Beckwith**

As an introduction to this paper, I should like to express a personal bias, one arrived at on the basis of some seven years of involvement in higher education planning at the state level as a member of the staff of the Michigan Commission on Higher Education: Non-traditional approaches to education frequently require the development and establishment of non-traditional institutional forms and systems of learning to be successful. Moreover, efforts made to graft such onto established institutions will be less than successful, and efforts made to change these institutions internally may be doomed to frustration and ultimate failure, except, perhaps, under conditions of extreme crises or through application of considerable external pressure, economic or political.

The history of higher education in this country contains many noteworthy examples of what I am talking about. These include the shift from the denominationally dominated, private institutions of higher education to public institutions, and the development within the public sector of land grant colleges and universities (initially institutions devoted to education in agriculture and the applied sciences). A more recent case in point can be cited in the development and implementation of public community colleges and in the establishment and expansion of private

business schools and other proprietary institutions.

Having acknowledged my primary belief in the need for new institutions to meet new needs and serve new populations, let me now quote two statements from Governor Milliken's "Message and Charge" to the Commission on Higher Education which he recently appointed. That charge, incidentally, was of a three-fold nature. The Governor, in asking the Commission to point the direction for the future of higher education in Michigan, stressed the need, first, for the Commission to assess, and when necessary, to redefine the goals, purposes, and functions of *postsecondary* education in Michigan, and the instructional *delivery systems* required to carry out such purposes.

He also asked that efforts be made to determine needed procedures and structures for improved planning and coordination of postsecondary education and, finally, that recommendations be developed on the means of providing most equitably for the financial needs of postsecondary education in Michigan in the years to come.

In structuring this broad charge to the Commission, the Governor also emphasized certain basic principles, two of which I would like to cite, for they tend to illuminate where I am coming from in my remarks this afternoon. First, Governor Milliken indicated his deep concern with and personal commitment to the concept of lifelong education and his belief that systems needed to be devised to further this objective. Secondly, he articulated his fundamental concern "that all segments of society have a basic right to participate equally in the higher education process, to the extent of their own needs and interests, limited only by factors of capacity and capability, not by economics or discrimination."

Such concerns as these led the Governor to recommend to the Commission not only that procedures be identified for more fully equalizing educational opportunity beyond the high school but that means be defined "for extending postsecondary education services to the broader public, through the establishment of new delivery systems," and that efforts be made "to encourage the general acceptance of non-traditional patterns of learning, and to reduce the reliance of institutions upon 'lockstep' patterns of educational development."

For myself, I have taken these words to mean a general commitment from the highest level of state government to general change in our present system of providing for the postsecondary educational needs of the citizens of Michigan and support for the exploration of new possibilities for extending learning opportunities to the public at large.

A little background may be in order here, for the benefit of those of you unfamiliar with Michigan's system of higher education – a system, incidentally, which has often been described as a "nonsystem." You must first take account of the fact that each of the State's 13 public baccalaureate institutions are seated in the State Constitution, and that the

boards of control of these institutions enjoy considerable freedom and autonomy over institutional affairs, including funds. The community colleges of Michigan, numbering 29 separate institutions, seem no less independent by virture of their governance by locally elected boards.

The Michigan Constitution also provides for an elected State Board of Education which, among its many other responsibilities, is intended to exercise "general planning and coordination" for higher education within the State. This same Constitution, however, directs that in carrying out this responsibility, the autonomy of the institutions shall not be infringed upon, a fact which gives meaning to the concept of "non-system" previously alluded to. What has resulted from this seeming contradiction in assignments of authority is simple confusion, particularly in the area of adult and continuing education, the developing new emphasis in postsecondary education.

## THE PROPOSED ESTABLISHMENT OF WOLVERINE STATE COLLEGE

With this background in mind, I turn now to consideration of a proposal for action modeled in terms of the Governor's charge to the Commission. This proposal, embodied in bill form (SB 998), was recently introduced in the Michigan Legislature with each of the five members of the Senate Education Committee acting as co-sponsor. The proposal calls for the establishment of a new institution of higher education in Michigan, to be known as Wolverine State College – an institution without campus or principal location – an open university in a word, one not unlike those already established in the states of New York and New Jersey, and proposed for establishment in several other states.

I know that you are familiar with the concept of the open university, but perhaps some of the features proposed for Michigan will be of interest to you. To begin with, the proposed legislation articulates three distinct state policy objectives, each of which is partially reflected in the Governor's charge to the Commission on Higher Education.

First, it is proposed that there be established under the umbrella of a single institution – expressly created for the purpose – a new mechanism for extending postsecondary learning opportunities to the broader public – a means of presenting the individual, in effect, with a meaningful alternative in pursuit of his own educational objectives.

Secondly, it is proposed that through means of contracts and agreements entered into between the board of control of this new institution and the boards of other established institutions, private as well as public, all or most of what is now termed "off-campus" education in Michigan could be financed, or subsidized, if you will, by the State on other than a "pay-as-you-go" principle and a means for assuring that the funds appropriated by the State for the purposes of adult and continuing

education would, in fact, be employed by the institutions for such purposes, this to be accomplished through application of a system of dual enrollments and by other procedures.

Thirdly, it is proposed that through employment of such cooperative arrangements, reasonable basis might exist for application of coordinated planning in off-campus education and extension of off-campus services to new populations, thereby assuring the avoidance of non-essential and possibly costly duplication of effort on the part of institutions statewide in this field.

Other provisions of the bill include the following: Under Section 4, authority is extended to the board of control of Wolverine State College to "enter into agreements, not inconsistent with this act, which may include agreements or understandings with other institutions of higher education . . . public and private . . . for use of instructional facilities, including laboratories and classrooms, and for the services of faculties, and staff, under conditions specified within this act, and agreements or contracts with other institutions of higher education, or private agencies, for the operation of appropriate instructional facilities or systems of learning that may further the purposes of home study throughout the state."

And under Section 5, it is also stated that "the board may: (a) hold in its name licenses for the operation of public broadcasting facilities within the state; (b) provide for the establishment of a centralized academic credit accounting and recording system; (c) provide for the development of equivalency examinations for college-level credit; (d) create through its own means or by contract learning resources and instructional programs for the furtherance of home study and individualized learning activities which may result in the granting of external degrees and similar recognitions of merit; (e) initiate other non-traditional study programs and services which in the estimate of the board shall further the educational objectives, and provide for the needs, of adult citizens of this state, whether vocational-technical, general academic, preprofessional, professional, or avocational in nature."

The concept of regional learning centers is also embodied in this bill. Such centers would be located on established institutional campuses – through reconstruction of existing, perhaps underutilized, buildings, under leaseback arrangements, or separately developed in areas of greatest need. The centers might be administered through contract with various institutions, public or private, two-year or four-year, or independently administered, depending upon circumstances or conditions.

These would be intended primarily to provide testing and examination services supportive of Wolverine State College programs. Counseling and guidance services would also be provided, and, when needed, tutorial assistance could be made available to the individual through such centers.

The state could, if it elected to do so, also carry on certain regional support services through such primary person-contact units, such as programs of student financial aid or certain social-service functions which might be tied to educational objectives.

The centers would also have primary records-keeping and research and evaluation functions at the regional level. Several might be employed as learning-resource service centers or production centers, depending upon need.

Uniquely, the bill provides also for the integration of State Library services in a learning systems context, for it provides that the State Library, "consistent with its general state charge, shall make its resources available statewide in support of the instructional programs and services of the Wolverine State College, to the extent needed or required by the board, and under terms of agreements to be entered into between the board and the library." It provides also that "The board of the Wolverine State College shall, in keeping with this arrangement, contain its purchases of learning resources, including books and materials, films audio and video tapes, and other such materials, within the inventories of the Michigan State Library, and provide for the support of the library to the extent agreed to . . . ."

This latter provision was included in the bill in recognition of the fact that libraries are of critical importance to all of adult education, but that institutional libraries should not be asked to assume a statewide responsibility in direct competition with an already established State Library system.

Now, how do we envision cable television in relation to such an undertaking potentially? The answer here is almost obvious. First of all, it may be necessary to distinguish between a cable application as closed circuit and one used as a means to distribute audio and visual messages to the general public. While acknowledging that cable is only one of several technological systems needed to make the Wolverine State College system function with maximum effect – others being standard transmission by broadcast, the use of cassettes (audio and video) film, computer-based instruction systems, and what have you – I nonetheless perceive the role of cable television to be central to the future in two important ways.

I believe, first, that a multiple channel system with two-way capability could be employed to tie the proposed regional learning centers into a coherent statewide network. Not initially, perhaps, but ultimately. (Recognition is given here, also, to the likely production capability of certain of the regional centers.) It is conceivable, too, that such a cable could be employed simultaneously to provide for computer-based instruction distribution between the centers and by way of the centers, between the established institutions, public and private. The University of Illinois' PLATO system provides a good prototype of an operational

capability in this regard.

As suggested, by such means, each of the designated regional centers may become not only an access point in a statewide system but a base for recording and redistribution of instructional materials and programs within a complex of local and regional community systems, which will provide the public contact so very much needed in the future.

The regional system so identified may, on one level, consist of contacts with major population concentrations – working populations, for example, in business, industry and government, wherever groups of working adults might be gathered together conveniently for the purpose of ajob upgrading training, or general education. On the second level, the regional system can be expected to tie into community cable systems operating on a commercial basis and thereby touch the homes of adults, for use as needed.

In this latter regard, the center system can be used, potentially, at least, as a means of providing the much-needed interconnection between the various community cable systems now in operation or proposed for future operation.

Let me digress for just a moment to point out here the activities of a joint legislative study committee on cable television in Michigan that is seeking a basis for public policy decision-making in this field. I am given to understand that this committee is very much concerned with the question of system compatability and the capability of developing interconnected systems, having possible application to the performance of the public's business in government as well as in education.

I point this out for, as is obvious to each of you, the potential of cable television in a state systems planning context, may well depend upon the availability of state guidelines in these essential regards.

Related to this concern is my belief that the full potential of cable in its application to education will not be realized until we reach a point of full spectrum capability on cable. We cannot, in other words, anticipate the effective use of cable in terms of single-channel reservations. The present rules for cable require such reservations, of course, and require also a simple 20-channel potential on the part of cable operators. Neither, in my estimation, is or will be satisfactory for the needs of education. Both represent continued application of a technical scarcity principle in practice, the position of the Office of Telecommunications Policy in the White House notwithstanding.

In the final analysis, the utility of cable for systems of individualized instruction, such as is envisioned in the concept of Wolverine State College, unless multiple-channel use is deemed both possible and economically feasible, may otherwise be limited.

## THE PRINCIPLE ADVANTAGES OF THIS LEARNING SYSTEM

1. The system proposed, which is supportive of a Wolverine State College, can be expected to provide improved student access to postsecondary education and result, thereby, in greater equality of educational opportunity throughout the society.
2. The system can be expected also to result in improved learning, in that it is based fundamentally upon a well known psychological principle which holds that learning will be enhanced when it follows from the individual's own need to know. The focus is on learning, *not* teaching; the student, not the instructor; the output, not the input.
3. The system can be expected to provide a more effective and efficient means for utilizing the existing potentials of public libraries and other community institutions, programs, and services, in direct support of postsecondary education.
4. The system can be expected to create the means for more effectively reintegrating learning experiences and work experiences (living experiences?) in that it builds upon a principle of cooperative education and relates systems for learning to the community as a whole. (Recall that medical education began in the community and only subsequently became institutionalized, as did legal education, teacher training, and much else that is now part of the modern university. What Wolverine State College may succeed in doing, therefore, is to further the movement away from the campus by relocating much of what is *real* in education from the campus to the community.)
5. The system may provide an excellent means also for stimulating public-private institutional cooperation. Service contracts entered into between public and private institutions, I would suggest, may be more effective in the long run as a means of providing support for private institutions than direct grants-in-aid, and have greater public appeal under given circumstances as well. By such means, in effect, we may more directly rationalize the public purposes to be served by private institutions.
6. Finally, and most critically, I think, the availability of such a system can be expected to provide a much needed stimulus for employers to grant released time for continuing education or in-service training. I can, for example, foresee the time when the State Civil Service might build into the worker's contract, a means for earning educational leave hours in the same manner as is now provided for sick-leave or annual-leave hours. And I can foresee the possibility of national, state, and local unions writing similar objectives into employee contracts. What is needed to accomplish

this objective, however, is the availability of a learning system that makes sense in terms of the needs and wants of the individual – one which can be made sufficiently flexible to serve such needs.

# CHAPTER 24

# CATV

# As A Means of Financial Support

**by Robert R. Stevens**

For several years, Vincennes University has operated CATV systems in two Indiana and two Illinois communities. These systems were devised and put into operation for the sole purpose of supporting the University's instructional and public television activities. The project, started in 1963, was the first in the United States to effect this unique CATV-ETV relationship. After a decade, it's still evident that all the problems have not been solved, but the venture has advanced far enough to prove the basic concept, and our future looks promising. This future was further enhanced on December 6, 1973 when the Federal Communications Commission granted a waiver of the Divestiture Requirement which now permits us to enjoy ownership of both a television station and CATV system in the same market.

## A TERRITORIAL UNIVERSITY

Vincennes University was the first college in the old Indiana Territory. It was the Territorial University founded in 1801 in a geographic area that consisted of the present states of Indiana, Illinois, Wisconsin, Michigan, and that portion of Minnesota east of the Mississippi. It is a community that is proud of its famous sons from George Rogers Clark, William Henry

Harrison, and Francis Vigo to the present day Prince of Clowns, Richard "Red" Skelton. It is Indiana's only publicly supported junior college, and as such, offers a varied and comprehensive approach to the needs of its students. It offers a college education for those who expect to complete career training in two years, those who expect to transfer to four-year institutions, and those who are simply interested in a general education.

The CATV story is rather complicated and unusual. During the late 1950s, the college was given a complete UHF television station by a member of its Board of Trustees. The station, formerly Channel 52 in nearby Princeton, Indiana, was moved to the campus, and plans were made to have it re-licensed and activated with educational programs. At first, the plan was to license and lease the station as a commercial venture. The University was to have an agreement with the lessee that would allow priorities for its own educational television programs. Much interest was shown by individuals to undertake such a venture. The major disadvantage was that Vincennes (population: 20,000) and its surrounding area make up a rather small television market, and when it became apparent that the major networks were not interested in an interconnection, hopes of putting a commercial station on the air were dimmed. At that point, the concept of CATV in support of ETV came into being. Why not a cable system? One that would show a profit which, in turn, could be used to support educational television. This was in the early 1960s when most residents of the area (and potential subscribers) had not yet heard the term "CATV" while a few had envisioned it as a means of receiving television signals from distant stations after all else had failed.

## FINANCING A CABLE SYSTEM

Franchises were applied for in Vincennes and Washington, Indiana and Lawrenceville and Bridgeport, Illinois. In return for the franchises, the Board of Trustees of the University agreed to pay each city 2% of the gross income annually. The University then funded a public bond issue to finance the construction of the system. The first was for $770,000 at 5¾% to be used for the construction of the systems in Vincennes and Washington. During the early part of the project, although the initial planning and construction were making progress, the University administration found itself constantly having to reassure the bondholders of the safety of their investments. But the system moved to completion as planned and financial obligations were, and have been, met on schedule.

In 1966, another public bond issue was made for $200,000 at 5¼% for the Bridgeport and Lawrenceville systems. Today all four towns are receiving the service of cable television. The system has been expanded successfully and presently has about 7,200 total subscribers in the four communities. It is estimated that the potential size of these systems is

12,920 subscribers. Each subscriber pays a monthly rate of $4.95 with an additional dollar added for each TV set in the home. A slightly higher rate is charged for commercial subscribers. Today, with the cable profits and a Community Service Grant from the Corporation for Public Broadcasting, WVUT is able to offer a variety of educational and public programs which were simply not possible before.

I think one of the real benefits during the early years of the project was the close relationship between the cable company and the proposed television stations. It was through the use of the cable company system that Vincennes University offered its early instructional television programs. This, in turn, kept ETV interest alive, eventually leading to the construction of the present television facility. With the aid of the cable company in engineering and personnel, WVUT, Channel 22 went on the air in February 1968.

## EDUCATIONAL PROGRAMMING TODAY

Today the station and cable company are continuing to share their problems and successes, with a complete interchange of ideas for better educational programming. Most successful of all the ITV programs has been "Remedial English". Dr. Harriette Klinker, head of the Humanities Division and Chairman of the English Department, pioneered this course built around the concept of presentations over CATV. Once each week, Dr. Klinker conducted two classroom hours on the cable system exclusive of Channel 22. During these periods, over one thousand students were placed in selected classrooms in various areas of the campus. Each of these rooms were equipped with two 23-inch television sets. In addition to the hourly ITV class each week, students received a full hour of laboratory with the use of audio-visuals and tape recorders an hour of writing and discussion on themes, and at least a 20-minute private interview with their instructor. Dr. Klinker's success in the remedial English field is reflected in the many students who have corrected their deficiencies and have, by the following semester, moved into regular college English courses.

Other courses on the system have included a complete English course offered for credit to viewers of Channel 22 as well as Cable 12. Student reaction to the in-school televising has been mixed. For the most part, students appreciate the use of audio-visuals, guest appearances by faculty members, panel shows, and groups.

The faults of the program have been technical not academic. Technicians check all television sets before each educational program, and the entire production is under the supervision of WVUT's Producer/Director. Breakdowns, which are now held to a minimum, happened at the most inappropriate times in the early years. When this happened, certain maintenance proceedures were generated to correct the

problem. It is interesting to note that many adults in the community made it a regular practice to tune in on our educational efforts and maintained an interest in our ETV cablecasts. The major disadvantage, with regard to originating cable instructional programs, is that only the Vincennes system is capable of origination. Head-ins in Washington, Lawrenceville, and Bridgeport are not equipped with originating equipment. Today we are planning such an interconnection to these systems through the use of a micro-wave system. Another disadvantage was that many times we were only interested in our programs going to a restricted audience. Since in the early days all cable educational programs were received by all subscribers on the Vincennes system, we were not able to use medical, nursing, and related programming. It soon became evident that an addition system had to be constructed that would serve only the campus. This became especially true after Vincennes University was connected to the Indiana Higher Education Telecommunications System which serves six state institutions and their regional campuses. The IHETS System, connecting Vincennes, Purdue, Indiana, Indiana State, Ball State, and in the future the Indiana Vocational Technical Colleges, is one of the nation's most modern telecommunications systems and deserves much more space that I am able to give it here. This system with its comprehensive Medical Education Distribution and other classroom-oriented courses must have the confidentiality of a closed-circuit system.

Today we plan our instructional television in two ways. One is the production and airing of regular college courses over Channel 22 and Cable 12 to a population of over half a million viewers over a 15-county area. Secondly, those programs designed for classroom use only as IHETS transmits are over our own closed-circuit system.

Today our cable system is carrying out its original objective – to give direct financial support to educational television programming over WVUT. With this financial aid established we must now move into that other area of cable origination. Many new avenues of communication are open to us. Within the next month, we expect to have a medical doctor's home connected to the Indiana Medical Educational Resources Program by use of a sub-channel. We hope this will be the beginning of sub-channel connections to professional persons such as doctors, lawyers, accountants, and pharmacists.

We have endeavored to operate our Educational Television Department with four broad goals in mind. They are:

1. To train students with a Broadcast Technology Curriculum.
2. To give every possible assistance to secondary and high schools in our viewing area. Whether it be cable origination or on-air television.
3. To give local residents a forum for airing local problems and issues.

4. To make available network programs from such sources as the Central Education Network (CEN); Public Broadcasting Service (PBS); and the Indiana Public Television Network (IPTN).

I feel this experiment at Vincennes has been successful and encompasses all the ingredients of support to our television efforts, but I must emphasize that the initial investment of a cable system in even a small community is enormous. In fact, expansion of our existing system into what would obviously be profitable geographic areas was hampered in the early days because of the expense involved. Anyone today contemplating this type of ETV/CATV partnership must approach it as a long-term investment, certainly not as an instant financial problem-solver for an already underfinanced public and educational television industry.

## PLANS FOR THE FUTURE

What can we look for in the future? This first decase has seen the development of the system into a sound vehicle of financial support. At the present time, we are still in an expansion mode with a backlog of potential customers waiting to be hooked up. The real development now should be toward multi-use of the system itself. We have planned for this also during the expansion period. All schools, private and public, receive free installations and do not pay a monthly charge. At the University, all new construction of residence halls and academic classroom buildings features a television capability for each room. All new cable system construction is of the 20-channel type, and all replacement of the old system is likewise modernized.

Plans are being made to offer to students and faculty an instant-recall audio-visual capability with which they can contact a central location and have a selected program beamed to their residence hall room or classroom. Some origination has already been done over the Vincennes cable system. The concept of an open public channel has been accomplished by our Public Television Station, Channel 22 providing public television for government, public schools, and the public at large.

In retrospect it appears the future of telecommunication is bright at Vincennes University because of the insight of those few in the early 1960s who envisioned the capability of CATV as a source of funds for educational television. A concept that now goes far beyond its original development has opened the door to a multimedia electronic age in a small mid-western community.

Cable Television and the University

# PART VI

# CHAPTER 25

# The University as Videopublisher of Last Resort

**by C. G. Bowen**

We have spent the past two days discussing interconnections between post-secondary education, a vast and traditional enterprise, and cable television a small, non-traditional industry that may be (if it survives) a useful ally. The contrast between these two enterprises in style, substance, and purpose is so great as to tax the imagination like the marriage of Arthur Miller to Marilyn Monroe: we approved in principle, but wondered what they possibly could say to each other. In a sense, the two days have been well spent, for we have learned that both enterprises are profoundly troubled; higher education finds it traditional strengths costly to sustain, and harder to market; cable television finds itself the most politically whipsawed new industry since atomic energy and its broader uses slow to develop. More concisely, if oversimplified, post-secondary education needs new markets; cable television needs new products: Two industries, contrasts in piety and impudence, length and brevity of history, ostensibly having served such divergent masters as high public purpose and private greed, hope that each may serve the other in a manner critical to the future survival of both.

Rhetorically, this glib analysis is fine, but *much too coarse-grained* for serious effect. Both cable and higher education will survive and more than likely do so by going their own and separate ways. Cable television can offer but marginal benefit to an enterprise which has yet to discover the

uses of instructional broadcast at present, the potential impact of, say, the telephone being introduced to a monastic order avowing silence. And with entertainment programming as the sole product of cable television it will be enterprising indeed for higher education to persuade the telecommunications community at large (industry, regulators, consumers), much less cable television system operators, that instruction, not entertainment, is the message of the future.

Nonetheless, we are here to try out our holds on each other, as cableers, or instructional educational managers, as speculators in future services development. And, as such, we have talked principally about our respective distinct spheres and a little of our future *shared* realm. Not for nothing is the question of our new product, of what we jointly propose to make and sell, left till last. The only fundamental link between our largest national industry and our youngest communications technology is the instructional programming the former will create and consume and the latter may deliver.

My competence to address the subject of product is derived from a professional lifetime of university publishing, publishing primarily in print, more recently in film and video. More specifically, I *have been* tardy in abandoning a highly traditional and pervasive publisher's prejudice that there is little more to instruction than lecture and print and more help for learners in organization of substance and technique than in newer, better-equipped classrooms or lower student-teacher ratios. My Pauline conversion took place while directing Franklin Book Programs, a not-for-profit American organization for translating American books into noncommercial languages. While its president, I endeavored to direct the modest resources and considerable energies of Franklin in directions more clearly supportive of technical assistance in printing and publishing, particularly the improvement of instructional print. I also grew more concerned about the heavy constraints of our principal product. In most of the countries where Franklin worked, from Egypt to Indonesia, half the school age children during my lifetime would never have a school to attend, and the half that did would drop out by the fourth grade, leaving them functionally illiterate. Three quarters, then, of the school-age cohort of the third or poor world's population would be unable to learn with print as their sole mediator of learning. It was then that I, first, came to look at other means of mediating learning, media without the threshhold requirement of formal literacy.

After returning to M.I.T., I began to examine how little our own national post-secondary instruction was mediated by interpretations or interventions other than those of lecture, and of print. But of more interest I grew increasingly concerned about the substantive costs of use solely of traditional learning devices. It was as though recorded sight and sound had yet to be invented. In spite of Biological Sciences Curriculum

Services, biology was being taught as a written subject, with laboratories added; dynamic and kinetic processes were being documented by formula and described by chalk drawn freehand on the blackboard. The visual fraction of a subject matter was being constrained as effectively as if it were prohibited by law, and not only in science, but in the humane and behavioral inquiries as much as in physical life sciences. Illustrations in textbooks and slides safely reposing in their unique, custodial, and remote enclosures offered visual subject matter more fully mediated post-secondary learning.

My concern sharpened as I came to examine what happens sequentially to the rich God-granted visual processing tools for learning that are the birthright of our children, and are successively suppressed from the fourth grade on, to a point where post-secondary instruction as a matter of course, and possibly of pride, rules them out of order. My preparation for a few tasks at hand was now complete. The restoration of visual learning to the array of competencies utilized in post-secondary instruction became a cause as deserving as had been the creation of instructional print. From that point forward, this publisher could no longer conceive of "the things of learning"[1] in traditional terms. So a reexamination of those traditions as they applied to instructional stuff became a major research concern, and here today I am the fortunate man who finds a forum for so idiosyncratic a specialty.

## THE TRADITIONAL THINGS OF LEARNING

Education has been religious in purpose far longer than it has been secular, and that legacy is important in instructional procedure, and in instructional mediation. The monastery and the cloister gave us campus-based instruction, not the moveable feasts of itinerant scholars and their students (the medieval open university, if you please) but fixed instructional plant, high walls, trees, and residences for scholars and students. The tutorial emerged directly from catechism; indeed the magic classroom size (30) emerges from Talmudic instruction, as Alvin Eurich has stated.[2] As it was with the campus, and with the lecture, so it was with instructional things. The substance of learning was recorded by the prevailing labor-intensive technology, and the scribes devoted lifetimes first to accurately copying the text and later to embellishing the page.

Perhaps the immediate ancestors of university publishers were these scribes attached to monasteries, charged with the obligation to preserve the precious libraries of handwritten books by making meticulous handwritten copies, often adding decoration and embellishment. The copying of text was done with great care, exhaustively proofread (for errors might involve heresy), then given headings and title pages of suitable graphic grandeur, and, finally, bound. The glorious era of handwritten

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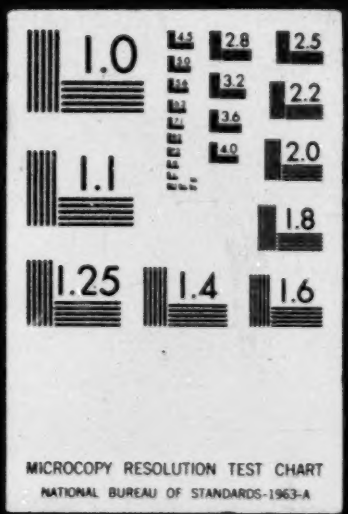

manuscripts and bound books was a massive step forward from previous devices for preserving thought and carrying it over distances in time and space; and the orderly procedures of proofreading and editorial care which were then followed continue to this day to preserve a text from one time and place to another.

The first textbooks – that is to say, those works studied or consulted in the process of instruction for whatever purpose – were copied books; they correspond to the modes of encoding then prevalent, but were not widely used. They were costly, cumbersome, perishable, and for all these reasons, access to them was highly restricted. It was the lawyers, who consulted text far more than the churchmen, who for reasons of convenience first changed the structure of written compilations from the roll to the book as we know it, with pages bound along one edge.

If the scribes were the scholarly publishers of their day, the antecedents of the publishers of textbooks may be found in the university students of former times who sought to provide their own low-priced copies of the classics. The historic role of the teacher in an early university was to read aloud from the classics at dictation speeds to gatherings of students. Rashdall, the great historian of medieval universities, suggests that the lecture then came to be divided into two parts: first, the reading of the text so that students could copy it, and second, selections of the most significant passeges within the text and commentary upon them. Later Odofredus, lecturing (the word dervies from the Latin, *legere*, to read) at Bologna in the early thirteenth century, augmented the dictated text as follows: "First, I shall give you summaries of each topic before I proceed to the text; secondly, I shall give you as clear and explicit a statement as I can of the purport of each Law; thirdly, I shall read the text with a view to correcting it; fourthly, I shall briefly repeat the contents of the Law and any distinctions or subtle and useful problems arising out of the Law with their solutions.[3]

Students, as enterprising then as now, quickly came to make arrangements with stationers who for a fee copied lecture transcriptions, or booksellers who rented out copies of full sets of transcriptions for the year. So much for the Italian line of descent for our textbook publishing. The other great university of that time, Paris, ". . . had its own statute on lecturing. Here the intention is to prevent the student from taking full notes – to prevent the publication and distribution of the masters' property. A later statute indicates the reaction of the students [to this early application of the principles of copyright]: 'scolars who throw stones at masters who speak too rapidly are to be fined.' "[4] The genealogy of textbook publishing thus had a proper combination of Italian enterpreneurship and French concern for proprietorship; it remains only to observe that so little changes with time.

As I have noted, education has been religious far longer than it has

en secular. To the educational monopoly of the early Church, the onastic schools, that secular substance came first in the Norse sagas, the *ong of Roland*, and the *Nibelungenlied*; and finally into this cleft arched the whole of the classical past – Greek philosophy, Roman law. ne medieval university, a scholastic institution embracing both the hristian and the classic past, was born. Its masters and students, bound r religious observation and practice, lived communally. It was poor, but ortable; and although relatively free from constraining forces of the urch, the state, or the local populace, such fragile institutions were given nction by both pope and emperor, which meant that a degree from any ne institution was acceptable throughout Western Europe. Teachers, udents, and indeed, whole institutions, could move at will from place to ace. The substance of the programs of these universities is of less concern o us than their teaching methodology, and, most pertinent, their use of structional materials. For all faculties – theology, law, medicine, and hilosophy –

> . . .The method was the same. In theology it consisted in acquiring the summa, the total body of the logical knowledge gradually worked out in the system of the theological doctors. In medicine, it was the learning of the medical body of knowledge laid down in the system of the Hippocratic-Galenic tradition. In jurisprudence, the student learned the body of the Roman and Church law. And in the philosophical faculty there was a regular body of Aristotelian and mathematical knowledge which was considered authoritative. In a word it was the textbook method. The books were meticulously divided into puncta (periods?), and professors were fined at Bologna if they did not reach the proper points at the proper time.[5]

Thus, working through a subject, relieved regularly by discussion, and ter rigorous examination (the baccalaureate examination at Paris lasted me televe hours, through which the candidate remained standing), a udent moved to his successive degrees. Specialities developed; one went Salerno for medicine, Bologna for law, Paris for theology. But the full owering of instructional use of the conserved word awaited the vention, or at least the application, of the new technology of movable pe.

An historical view of the evolution of the textbook illumines the niverse of other instructional things. From the beginning, the textbook ffered substance, that body of learning was to be conveyed across time nd space from mentor to student. But it also came to offer a structure, ne instructional strategy of presentation. The textbook was, and is, a ighly ordered learning instrument; it presumes a curriculum and conserves s subjects' place therein. It creates a lesson plan or syllabus to guide both eacher and student. It offers interaction, through questions and answers, udy or research assignments, suggestions for further reading and

integration of further reading with the text. And increasingly it came to offer evaluation, self-administered examinations to quizzes, to help the student find his way through the lesson. If the elements sound familiar -- substance, structure, strategy, performance measures – it is because the textbook from mid-nineteenth century America to much of the world today constitutes not merely the foremost, but the solitary instructional "thing" used by most teachers. Teachers have been trained to use textbooks; they enjoy the freedom to chose or select among many optional texts; they may adapt their course work from greater to lesser conformity with the substance and arrangement of a given text; and, critically, they hold the prospect of creating their own text if none exists to serve the course as they wish to teach it.

Contrast this with the circumstance facing visual (read video) courseware or textbooks: Teachers are not trained to use non-print instructional stuff. There is little organized distribution and supply of non-print material. An instructor is constrained to use the non-print material as given, if at all, and further constrained in time, place, physical circumstance, and other logistical concerns. Further, if no such material exists for his course, he is constrained by skills and cost from creating his own; it is as though each instructor who wished to write a textbook were obliged to take his ideas to the bazaar and hire a scribe to set down the text, and then never see mass reproduction of the copy, but rather other handwritten copies.

Thus, the elements which have defeated instructional television and frustrated the full visual and textual presentation of subject matter, whatever the field of study, are still with us. We have infinitely increased the speed and flexibility of text copying; from moveable type, the invention of the typewriter, the production of mass market editions of texts, and the growth of better copying devices, text and graphic presentation of subject matter have been vastly enhanced. The constraints upon the non-print media, constraints of entrepreneurship, proprietorship, originating or authoring competence, mechanisms for inexpensive reproduction, widespread distribution, and resulting economics of scale resulting in lower cost – all these still constrain lie the non-print media.

How can the creation, production, distribution, and finance of non-print instructional materials be brought into existing or new structures such as have accompanied the growth of print in service of instruction? A word about each role.

Traditionally, the university and college have been the seat of creation of textbooks, the setting in which the authors or creators were found, were institutionally at work teaching their courses thus developing the instructional formats and strategies which would result in the printed course texts. This setting was where the initial drafts of a text were tried out, were validated by first use, for subsequent widespread use elsewhere,

and no bias operated against such use but as it differed from goals and altered direction or emphasis from another's preferred rendering of the same subject matter. In the developing world, not only creation, development, and field testing, but production and distribution as well are the task of the university. In lands lacking independent entrepreneurial publishing, it is the university itself which sees its books printed and gets them distributed. In industrial countries increasingly, and in this country for nearly a century, commercial entrepreneurship has been the midwife, the vital link between institutional creation and institutional consumption of printed instruction that has performed the critical service. Our historic textbook publishers, by means first more foul, then more fair, created markets of scale and so gained the benefits of scale from larger production runs and mass distribution of the goods. Granted, their markets were preconditioned; the potential consumer could read the language of the text, and use of the text was constrained by no special requirements of equipment, power, compatibility, illumination, or what have you. And, in our time their markets have dissagregated -- the university student of today buys fewer textbooks, but many more individual books for study. The result is that the role of the commercial publisher as producer of instructional print is greater than ever.

We may, therefore, summarize the present circumstance vis-a-vis print and non-print media as follows:

1. The role of the university with regard to instructional print is that of creater, or as supplier of authors; as financier for its vast investment in opportunity and overhead costs in the development and testing of textbooks; as consumer inasmuch as it, and its institutional stores, constitute the overwhelming channel for the distribution of instructional print; and through its libraries, major consumers and conservers of instructional print, since these instructional services by their steadfast dedication to print, and their equally sturdy resolve against non-print materials, serve to assure the dominance of print in the instructional enterprise.
2. The major congruities and contrasts between print and non-print are evident throughout: In creation, a contemporary textbook may be fashioned today, just as other learning systems, by teams of specialists, subject, pedagogical, media or graphic, and evaluation specialists; but it also may be created by an individual teacher sitting down at his typewriter nights and weekends, through terms and vacations, producing his own unique textbook. We have as yet no equivalent for the video-typewriter unless it be the porta-pack; and we have scarcely begun to grow a generation of video-text authors. After two generations of universal acceptance of film entertainment and one of television, we have yet to inspirit a desire for, or offer, institutional literacy in these powerful media and equip our future teachers to

think in these languages, to devise grammar and syntax for their use, and to apply them effectively in the business of instruction.

3. Our national production of instructional print is phenomenal, both in quality and quantity. Our major college textbooks are well designed typographically, printed very well on excellent paper, and produced in mass editions at a remarkably low price. Whereas for non-print media with the exception of microforms, there is no massed technology for widespread reproduction at lower cost. Rather, iterations from a master print are unitary in cost. In non-print media production, we are someplace between Gutenberg and Caxton, and each copy of the master work is painfully, carefully, and expensively wrought.

4. In contrast to the distribution of large lowpriced editions of standard printed instructional works to markets of scale, we have no markets of scale for non-print instructional media. What the Textbook Trust accomplished in two corrupt decades in the late 19th century by creating large-scale markets has yet to be achieved through interventions by policy or funding at any governmental level. And were there institutions to be found expounding the desirability of using non-print media of a particular size, shape, or substance, there would remain the problem of utilization. We have built heroic instructional plants in the past century for higher education, but an individual classroom or library reading room looks and is now equipped much the same as it was then; the most pervasive change in our higher education instructional physical plant is possibly the shift from blackboards to greenboards.

A further contrast between the media is pedagogical acceptance. Could textbooks ever have been as distrusted, as little accepted, by faculty in the past as film or video courses produced elsewhere are to our faculty today? A faculty member will accept Samuelson's *Economics* as a Unitarian minister accepts the Revised Standard Version as a point of departure, a useful source, but with no thought that its use as a text constrains his pedagogical freedom. But when considering Miami-Dade's mathmatics course, or our M.I.T. Center for Advanced Engineering Study video course, "Calculus Revisited," the first response is apt to be cast in terms of academic freedom.

5. A last contrast is the impact of the financial scale and the institutional arrangement for meeting the cost of instructional development. Here the contrast is stark and real. In the absence of large scale for any of the reasons just cited, the heavy initial investment required by non-print courseware is a major deterrent to innovation. The development costs are great (up to $60,000/hour); the utilization costs may be even greater. I have met those who argue that formal higher education in America simply cannot afford to re-equip itself in the sense of cost of training its staff, refitting

instructional spaces, restructuring of instructional time (both that of mentor and student) so as to make the fullest utilization of both print and non-print media. The burden of greatly higher costs in both development and utilization deters the commercial publisher entrepreneur and leaves the university no longer just prime creator and consumer of these instructional materials but publisher as well. Having been conditioned by experience and tradition to accept merchandizing investments only in pre-tested instructional stuff for markets of sufficient scale, the traditional college textbook publisher finds it hard to move non-traditionally into the full acceptance of what in the past has been society's contribution to extending his product line.

## FORCES FOR CHANGE

In this unappeasing climate, in the face of the changing (and economic threatened role of the faculty, in the prospect of slow growth of visual literacy and competence, and in the easing of institutional regidities against the use of non-print media, but of somewhat great flexibility in schedule, pace, and locale of instruction, what difference, if any, can be accomplished through instructional adoption of cable television?

The answer today most certainly is little, if adoption is not accompanied by, or part of, other changes or reform of traditional post-secondary instruction. With reform or with new markets largely to be served outside of campus-based instruction, the prospects are better. These prospects we have heard about these past days: extended delivery, cheap transmission, instructional variety, economies of scale, particularly in long-haul delivery. We have heard also of requisite institutional adjustments in the management of instructional resources that might favor or enhance the usefulness of better delivery mechanisms. Our universities are much more than aggregations of faculties and students. Over time, university services, like those of other long-established bureaucracies such as the church and the military, have sprung into being to serve their particular clientele. Major universities such as those represented here have departments managing their portfolios, their telephones, their real estate; and their services which might be directed into support of their instructional program would include their libraries, their university presses, their computation centers, their radio and television services, their offices of tests and university examiners, their centers of research in learning and teaching. Of these services, some have from the first been clearly dedicated to support of instruction. But from the support of traditional instruction, they may now need redirection toward support of less traditional instruction. And others most notably, the university's press and its radio and television services, scarcely relate their existing mission and presence

to instruction at all. Let us consider the present and potential role of several university services in a more fully mediated instructional effort.

The library rests at the center of print-mediated learning. Insofar as the great university libraries serve principally the research interests, of their universities, their traditional preoccupation with print, as in the devotion of university museums to artifacts, is still central to their mission. But in a library geared to serve instruction, how can one justify the near total dominance of print, or more correctly, the literal forebearance from non-print? The rationalization most frequently heard in response to the charge is that libraries buy and circulate those instructional things that instructors want and specify. But we all know the latitude, indeed the obligation, under which our university libraries have built their collections in the past-World War II decades. They, not the instructional staff, have taken the initiatives, have initiated the service mechanisms, have pioneered the innovations in using print in new forms and ways. Why then have they so neglected the visual complement to print?

Two reasonable adjustments to current instructional library practice are offered as essential to the creation of a better or more favorable instructional environment. First, let library acquisitions budgets be examined in the context of university-wide instructional goals and the tools and instruments that are obligated by those goals. And second, let the rich experience of university libraries, particularly in the useful form of instructional production they know well, the production of microforms, be geared into the university program for creation of non-traditional materials of instruction.

The university press is peculiarly American in its historic commitment to research scholarship, rather than managing the creation, production, and distribution of the tools of instruction. Among others, I have analyzed this delimiting of the potential area of service and concluded that it was all the result of the Textbook Trust. If the Trust had never succeeded in creating markets of scale for textbooks, then commercial publication of most university-created print would have resulted in this country as it did the world over. But concentration on an instructional product to serve solely the markets of scale left the American textbook industry very cool to the prospect of publishing the thousands of doctoral dissertations, publication that was a requirement for the Ph.D. degree until World War II. So long as the degree obligated the candidate to publish, there had to be a publishing capability, and finding none among the commercial publishing sector, American universities created their own. A massive redirection of the resources and skills of existing American university presses into instructional channels, a reallocation of university resources invested in the development of these presses, is a high priority for contemporary universities to consider. For no instructional systems yet designed have greatly diminished the role of print, and where does a

university more appropriately find revelant skills for development of innovational instructional print than in the university's own publisher?

Moreover, the university press is a gathering place for skills highly useful to the creation, development, and marketing of non-print materials, though the production technologies differ. Editorial procedures would well serve the tight scripting of instructional systems and components, design and production; the planning of publication methodologically is very much akin to the development of other learning products. And the marketing of goods and services created by a university is unmistakably better managed by a university press than by any other marketing entity around – including the universities' admissions office – and infinitely better than the experience I have observed in the marketing by centers, institutes, or departments themselves of non-print media. This is not to argue that non-print marketing ought to be done solely by university-based capabilities, but that adaptation or change in the existing structure or capability of the university press would serve well the marketing of innovational non-print.

There is considerable gain in examining current trends in the structural arrangement and management of university computing services. Originally serving research, they tended, like portapacks, to proliferate, and organizational response first was to centralize their administration. Under such arrangement, instructional usage came last.

Now a computer generation has passed, and the single structure is being divided between (a) operations, or maintaining the integrity of the system, and (b) user services or doing interesting things with the capability, particularly instructional things.

One computation seer, Arthur Luehrman, Director of Project COMPUTe, Dartmouth College looking further down the pike, foresees the potential disappearance of operations per se as a university computing responsibility as shared usage and computer networking grows, and foresees a major rededication of campus computing direction and manpower to exploring needs, designing responses, and providing assistance to instructional and research (note the order) deliveries.

There was a time when one spoke of educational broadcasting. Not being a chartered member of the club, I salute those hardy pioneers who stayed with their mission and are still today directing the instructional broadcasting services of their universities. But what once was a university-based educational broadcasting capability of some dimension became, more than the name change suggests, public broadcasting; and as one midwestern academic vice president told, "We found that our broadcasting service was 90% public and 10% education." He added, "We intend to invert the ratio." It is no criticism of public broadcasting to agree that instructional television and public broadcasting never synonymous, have diverged in mission and programming since public

broadcasting came to be. The overwhelming fraction of federal investment in educational technology goes to upgrade and improve our national educational broadcasting plant; yet the utilization of that plant is overwhelmingly for entertainment, albeit, for most of us here the only entertainment broadcasting that we enjoy. It is for the policy makers to determine to what extent and how far public broadcast should enjoy national television coverage through additional and improved plant. But is surely the prerogative for each university which numbers among its myriad services a radio or television facility, and which annually supports that service with staff and power and programming development, to ask that appropriate fraction of program time be dedicated for its instructional use.

Last, some services, though available commercially, have grown up on our campuses not for reasons of cost but convenience. Most evident, and least noted among these, are the entities variously labelled graphic services, or university printing, or official publications, or audio-visual services; by whatever the name, these departments supply the grease that makes the instructional engine run. From the departmental mimeograph machines to the monopolized institutional copying franchises, from the making of slides and transparencies to the preparation of film strips and maps – these constitute the enfranchised, but customarily remote, instructional support services absolutely requisite to more fully mediated instruction. Characteristically, these services, prior to the advent of xerography, operated with some university subsidy, and some, depending upon their copy-center pricing formulas, may still. But they have always been seated below the salt, as have their fellow mediators, the publishers, the broadcasters, at the instructional development table. The practitioners are hard working, responsive, unendingly anxious to cooperate, yet accursed; it has been their lot to serve instructional technology as traditional instruction would have it, on call, rushing a projector or receiver to the classroom, at an institutionally determined cost unvaryingly judged high by their instructional contractors.

These university resources – services created, supported, and sustained by the university – these instructionally related services are to my awareness nowhere integrated as equal partners in the enterprise of preparing instructional programming for their institutions. Each serves its institution in its chosen or traditional ways. Occasionally, organizational restructuring functionally unites some services in the form of a media center or consolidates some responsibilities in the form of a new administrative office or officer. Although improvements, they will not save the patient. To mediate their instruction more fully, universities will have to structure and mobilize their full instructional resources – faculty, students, libraries, print and microform publishers, broadcasters, design, audio-visual, xerographic professional capabilities – in an integrated purposeful way.

## WHAT HAS ONE PUBLISHER OF LAST RESORT LEARNED ABOUT VIDEOPUBLISHING?

The Center for Advanced Engineering Study at M.I.T. is not a think tank, but is dedicated to continuing mid-career education of engineers. For those of you, like myself, who are humanists, you must understand that engineers, like Detroit automobiles, depreciate rapidly in value as technology changes. They enjoy a short-lived bloom, entering the job market at 50 to 70% of their highest annual wage, and without refurbishing, find themselves without appropriate skills for lateral assignment 10 years after graduation.

The Center chose to create courses not for specific credit, graduate or otherwise, but service courses designed to provide or refurbish essential skills, in math, process engineering, and such areas.

M.I.T. is so far as we know, the only university in America which operates a fully functioning instructional videopublishing program. It creates its courses, produces the print and visual components, warehouses its unsold stock, undertakes to market its courses nationally, and enjoys some partial success in the enterprise. Our CAES self-study program offers a dozen courses of varying length, and has eight more between storyboards and the can. We will sell, rent, or otherwise gain revenues of more than two hundred thousand dollars on our product this year. Let me make a few generalizations about our experiences, organizing my comments along the functions of publishing: editing, production, marketing, business financial, and warehousing and distribution.

*Editorial:* Our principal authors are faculty members working in conjunction with a film or video producer, a studio production team, sometimes a research or teaching assistant, and that's it. There is a collaborating crew, but we have not yet evolved the ideal four-man team (famed in theory and embraced by the Open University) of a subject specialist, a pedagogical specialist, a media specialist, and an evaluator all working synergetically in the design and creation of courses. Our faculty members fill substantive, pedagogical, and evaluative roles. They also write the study guides, and though we augment their capabilities, their traditional roles in design and creation are largely conservative. We pay them royalties for their labor and their creative endeavor by buying released teaching time from the Institute. Our own return comes from our successful marketing of his work. In short, our "author-publisher" arrangement has evolved from a pragmatism born of a mixture of economic and professional constraints.

*Production:* We have helped ourselves, as videopublishers, by a high investment in equipment and skills for our video components, and perhaps hurt ourselves by formats too rigid, by shooting too many standup lectures and talking heads. A videopublisher uses a lot of print. Our video and film

materials have a top standard of broadcast quality. Our print materials are more informal, not in substance, but in makeup and style of product. We produce study guides so instructionally helpful that one of our two university customers (Dean Tom Martin of SMU) called them our most valuable instructional product. But they are short-run publications, so we type masters, print offset, and try to sell them as inexpensively as possible. We use a standard text book whenever possible, and only when none can possibly serve, do we resort to creating a new one. Even then, that text is published commercially or by our M.I.T. Press. Our production staff is tiny and is responsible for both text and visual components. Our major production dilemma is the video-to-film conversion—most of our customers want our courses in 16mm finished film. An offset master produces a thousand copies of a text page in minutes, and at a low marginal cost. But neither film nor video can be printed – that is, be reproduced in quantity rapidly, nor does the cost decline as with printing linearly with length of run or number of copies.

*Marketing:* Constant national marketing is essential: In spite of seven years of beating the drum, very few institutions and businesses know our courses. This is because a serious review of a highly mediated instructional system is expensive, time-consuming, and very hard work. There are no other reviewing mechanisms. There are no shareable exhibits for small publishers at the meetings we should attend, and individual exhibiting is prohibitory in expense. There is last the problem of transferability – M.I.T., all in all, enjoys a good reputation, enough so to attract very good students. Nonetheless, until Dean Lionel Baldwin had the courage in 1972-3 to install our calculus course alongside his own live, and his videotaped, Colorado State calculus course, and test our course against his course, no university had so much as tried it, and only a handful had asked for the preview package. Previewing a video course is hard. A textbook gets sent free to a potential adoptor. He examines the book at his leisure, usually at home, then, if he likes it, asks the university store to order it for his class. Videopublishing entails a marketing effort that must anticipate hardship in preview or evaluation, must overcome enormous inertia in adoption, and requires substantial physical and logistic management in use.

*Business and financial:* The front-end costs of this kind of publishing are large and ours have been sizable, larger because of our resolve to offer broadcast quality. In roundest terms, our total investment covering building, equipment, and skills, to date for twelve courses is close to one and one-half million dollars and, as you heard, we will in our sixth selling year, move 20% of that in sales. No commercial enterprises could or would operate this way. Ours is a prototypical effort, an experiment in instructional production and delivery, and as such, what we learn benefits the total community of American higher education. In the best sense, society is subsidizing us to undertake this experiment, in the Sloan

Foundation and U.S. Office of Education that set us up, in the support of M.I.T. by private and business philanthropy, and in publicizing our work at meetings such as this. But early losses are to be expected where product development must be pioneered and institutions must be rearranged before the product can be marketed. We will never fully regain our development investment, but we aim to achieve a steady state of sales income and operating expense including cost of new product development. Our courses are not budgeted as high cost—instead of $10,000 – $60,000 per finished instructional hour of much instructional television, we are spending $3000 per instructional hour. And the true cost to the customer is, of course, determined by the number of users.

*Warehousing and distribution:* This traditional publishing concern is not, for a publisher of our scale, unduly burdensome. Film and video are bulky and have special storage requirements, but these aren't serious. Moreover, the miracle of the postal system, which serves us very well most frequently, and on one occasion, shamefully, takes care of our distribution. However, we are marketing nationally an instructional product limited in its service capability- we cannot bicycle live instruction around the country as the US mails do our tapes and print. Personally, I would hope that one or both of the domestic satellites add a dedicated educational transponder gambling that if it exists, places such as M.I.T. will have a use for some fraction of the transmission year. M.I.T. has followed slowly along the path of our colleagues at Stanford, Colorado State, SMU, Penn., and a dozen others which are by now well versed in live instruction via broadband. We have not used Instructional Television Fixed Service, remote classrooms, or other wired or broadcast transmission of live or recorded instruction. But granted our valued courses and an accessible national broadband communications network, we would offer live or recorded instruction in whatever mode to support our courseware.

**WHAT TO DO?**

For the forseeable future, your universities will be obliged to become publishers for non-print media. They will be so obliged because the markets, where visible, are small and fragmented, and too risky for commercial enterpreneurship. Thus, for much the same reason as they created their own university presses and broadcast services and graphic services, universities will integrate these capabilities with instructional faculties and staff and create, distribute and consume own instructional non-print programming.

Moreover, since the production costs are high, institutional sharing is in order, and is happening. Jack McBride's Mid-American University plan is one such regional conception. M.I.T., Colorado State, and SMU have begun an examination of what sharing might mean for the realm of

continuing engineering education. Universities do not share gracefully, it has been pointed out, but the models of the major curriculum revisions of last decade and the regional laboratories – two experiments serving public elementary and high school education – offer guidance, both positive and negative.

The first act of the university as videopublisher is to get its instructional house in order, to integrate its instructional resources, and use them effectively for its own purposes.

The second act is to find partners for an enterprise which inevitably will be long-term and expensive.

The third is to identify useful collaborators in the nonuniversity world. These begin with industry, which has had the courage to test non-print instructional tools and make them succeed. To industry, I would add the military, which has the unenviable task of processing 400,000 students a year through programs where failure cannot occur. And last, by their scale, but full of pride for their hardiness (Or should I say foolhardiness?) those pioneer/commercial publishers of video courseware who share our present concern and risks, for theirs is the solitary marketing experience we can trust.

With effective use of existing instructional resources, with lots of mission sharing with other universities, and with the help of those we have not always treated as friends, higher education can produce video programming of merit for this evolutionary period; universities will gain additional markets; cable television will gain a new product; and the burden of being publisher of last resort may prove to have been a blessing for all concerned.

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# CHAPTER 26

# The University and The Videopublisher*

**y Harlan Kleiman**

Today's university is a handcraft industry in a mechanized world. As ich, it is often confronted with technological opportunities that prove ifficult or impossible to act on. The latest challenge is the audiovisual niversity press.

In the next few years, the impact of audiovisual on education will ake it imperative for universities to either establish videopublishing icilities internally or in conjunction with an existing videopublisher.

As non-broadcast audiovisual communication becomes less expensive, mpler to operate, and more widespread, the university will have a new ool to provide more comprehensive learning in a more dramatic format ith less faculty time spent at repetitive one-way communication. It will so become an income source for the faculty and a new profit center for ne university, helping to alleviate some of the pressure caused by the rinking academic dollar. Such a communications system can accomplish n audiovisual presentation of the university's human and information esources more effectively and more efficiently than any technique now in

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existence.

## WHAT IS VIDEOPUBLISHING

Videopublishing is the creation, production and distribution of content – be it entertainment, information, motivation, instruction – in video format for non-broadcast utilization. Actually, it is not a new industry. It was formerly called the educational film business. But with the advent of videocassettes, cable, closed circuit tv, microwave and videodiscs, it has been revitalized and expanded, and given the new name of videopublishing.

A 1973 report by Brush Associates in Yonkers, New York, on "Private Television Communications" states that "private non-broadcast tv production has generated a $207 million industry that is expected to triple in size in the next three years." It also states that private organizations and the government produced 3,500 hours of tv programming during 1973, with at least 300 companies and organizations regularly originating and distributing their own tv programming, and that number should double in the next two years. The report cites 76 private video networks and considers this optimistic for new videopublishers, since many of the networks will buy "supplemental offshelf programming."

What does this mean to the university? How can a university maximize the potential of video? First, as a method of instruction – with or without the presence of an instructor. Second, as a study tool to be borrowed by students for reference. Third, as a marketable product to be sold to other universities.

Universities have the specialists whose expertise would tie in well with the necessities of videopublishing. One interesting rule of thumb has prevailed since the industry's inception: The more broad-based and general a video title is, the less successful it is in the marketplace. Hence, a video published course on "Budget Planning" will not be as successful as "Budget Planning for the University" – or better yet, "Budget Planning for Private Catholic Colleges."

## VIDEO TO IMPROVE EDUCATION

Every educational institution faces specific problems today such as rising costs, accelerated curriculums, larger classes, and a generally higher level of expectation on the part of students. Video, in its optimum form, could relieve many of these burdens and could, if correctly employed, dramatically improve the general quality of education.

How can the videopublisher and the university pool their resources to achieve new and significant audiovisual software?

Let's look at what audiovisuals can do for the instructor and the

student: They can expand or enhance a live presentation, substitute for a live presentation, allow a live presenter to be in many locations, and serve as a source of review of the presentation. In all but the first possibility, the instructor is in a once-removed situationn. This puts an additional burden on the videopresenter . . . to induce the student viewer to watch and learn without the dynamic of the instructor being physically present. This is the challenge of the videopublisher.

The videopublisher, like the print publisher, looks at the university in a schizophrenic way, both as a resource and as a purchaser of product. However, with the complexity of video, the potential relatinship becomes more encompassing and more complicated.

## PROBLEMS AND PITFALLS FOR UNIVERSITIES

The videopublisher has developed procedures for ascertaining the profile of a market, creating programs in form and content that fulfill the needs of that market, evaluating the marketability of a title, its potential sales universe, the feasibility of production, duplication and distribution costs, and finally, a monitoring system to test the program's effectiveness once it is in use.

The university has vast information and human resources and, in a number of cases, first-rate video production and editing facilities. In order to successfully merge these abilities, videopublishers must spend more time developing audiovisual presentation skills with universities. If a member of the faculty chooses to write a book or article, the method is generally well-defined. If the same individual wants to publish a video essay, it is not quite so simple. First, visual research is usually required. A piece must have a form and style of presentation. A cameraman, editor and/or director will be needed, depending on the complexity of the piece. Varying degrees of editing skills might be required.

The newness and complexity of videopublishing forces many professionals to keep away from it simply because they don't know how to use it. It is as if a physics professor were told that his presentation should be in Greek. All he can speak is English, and most of his adult life has been spent increasing his ability to communicate physics in English. English is merely the mechanism; physics is the subject. Like English, video is the mechanism by which one can more effectively communicate physics.

If a physics professor videotapes his lecture/demonstrations for his own students or for their reference, the quality of the presentation will not be overly important because it is only a reinforcement of his live presentation. However, when it is to be packaged and sold by a video publisher to other institutions, another level of expectation prevails.

It is difficult enough for an academic writer to deal with a print

publishing editor let alone this unknown called video! Now, the individual who would ordinarily cloister himself until his article or book was finished must, if he wishes to present it audiovisually, operate every differently. He will be the director of a team made up of a video writer, audiovisual researcher, video director, cameraman and editor. (In small productions, however, this might be one person.) To complicate things even more, most videopublished programs will be a combination of video and print, each medium having inherent strengths over the other.

## INTEGRATION OF PRINT AND VIDEO

Video is a linear medium. Information is presented at the same speed for the rapid and slower learner. Print has a far greater random-access capability than video. Therefore, the print portion of a videopublished program should consist of:

- factual data and detail
- expansions or clarification of the video data
- summaries and precis
- other resource material
- bibliographies

The integration of print and video to generate maximum communication effectiveness is the key to the success of an academic videocassette program.

In essence, academia might have to begin thinking in a new language – Audiovisual!

Non-broadcast video will dramatically proliferate in the second half of the 70's, and the creative thinker of the 80's will think and speak 'audiovisual' as well as his native tongue. Making the transition is going to be difficult.

A change in outlook regarding the status of audiovisuals is necessary. Institutions tend to treat audiovisual material differently from printed texts. They think nothing of using a basic sociology or economics text and customizing it to their own needs. But when it comes to the same information presented audiovisually, they treat their own organizations like proprietary baronies. If the information presented does not totally reflect their profile, it is – more often than not – rejected.

This is where the independent video publisher can be most helpful in working with a university on hardware design, product priorities, marketing, and general production criteria. Production quality and content presentation must be close to what the viewer has become accustomed to on broadcast tv. Every viewer approaches the video screen with a certain level of expectation, and if the quality is less than that, the instructor has an extra burden to overcome.

The net result of working with an experienced videopublisher will be

nore efficient use of valuable faculty lecture time, an audiovisual record f courses, a set of criteria for evaluation of the marketability of a lecture r series, new faculty/administration audiovisual sophistication, and a new rofit center for both individual faculty members and the university.

# CHAPTER 27

# Prospects for Coordinated Videopublishing among Universities

**by Bryce Jordan**

I am a layman among professionals, and I can only hope that I don't end up being a lamb among wolves. As a music historian who doesn't know a gigahertz from a film chain, I come to you with the conviction that educational media, which had a chance sometime ago to be extremely effective, has not been universally successful. The field, I believe, has a chance once again to become a principal means of transferring knowledge, enjoyment, and understanding, but only if the dollars can be found.

What I am going to present in this paper is a case study of how an educational television operation, successful over a number of years, can be updated to become more attractive to those people who are the only reason for its existence – namely, the students who use it. For a moment, then, let me describe this operation to you.

## THE TAGER PROGRAM

TAGER, The Association for Graduate Education and Research in North Texas, is now in its seventh academic year of operating The Green Network, a closed-circuit microwave educational television system which interconnects nine colleges and universities over approximately 2,000

square miles in the North Texas area. There are in that 2,000 square miles approximately 100,000 post-secondary students of various kinds and about 5,000 faculty members. Each TAGER institution has established on-campus studio classrooms which enable it to offer over the network certain credit courses and other academic programs desired by member institutions. It is also possible for each institution to receive courses and programs.

It is well known to most of you professionals that one of the most active and effective uses of TAGER television over the years has been the graduate instruction which Southern Methodist University's Institute of Technology has provided to the high-technology industries of North Central Texas. Beyond that kind of activity, however, the system has in recent years begun to serve in a very effective way at the undergraduate level, utilizing some of the fine liberal arts colleges which belong to the network.

TAGER television customarily carries about 75 three-credit courses each semester, involving between 1,600 and 2,000 students. One of its real strengths is the talkback feature which is available to all students and to all classrooms within the system. Each student is able to maintain his status as an active participant on the whole network, and those who listen are able to take advantage not only of the lectures and illustrations, but also of the questions from other students and the answers which go back in response to the questions.

One thing has happened in TAGER in recent times which is of very great importance. There is now a hospital wing, if you will, to the network. The University of Texas Health Science Center in Dallas is now able to carry a television presentation of grand rounds in the teaching hospital to various other hospitals in Dallas. Further, we hope that these transmissions will before long be carried to other cities such as Sherman, which is 60 miles to the north.

We are very much aware that the present television system has not only the possibility of expanding and improving its interinstitutional course offerings but also making available the extension of academic service to new clients – that is, those individuals who want independent study, continuing education, refreshment, and retraining. This is one of the policies I think TAGER will pursue during the next few years, pushing its extension activity beyond the industrial interconnects, which have worked so effectively for the SMU Institute of Technology and for certain of the business schools in the area, to other kinds of continuing education.

This brief description of the TAGER television network, along with a hint of the network's future potential, will serve as an introduction to the topic which I have been assigned more recently – namely, "Prospects for Coordinated Videopublishing among Universities."

## COOPERATIVE TV PUBLISHING

Let me say first off that my understanding of the definition of videopublishing may be a bit broader than what has been stated here so far, which seems to consist of vast shelves of videotaped courses. We at TAGER are looking at the possibility of cooperative "educational T.V. publishing" in a somewhat broader context as we study the Green Network and its potential.

As I noted earlier, TAGER TV has moved to various kinds of undergraduate activities with considerable success. Primarily, these have taken place in the summer and have involved environmental studies offered by Austin College, Dallas Baptist College, Texas Wesleyan College, and Bishop College. This effort has been influential, I think, in pointing toward more cooperative curricular planning, no small accomplishment. Beyond this summertime environmental studies effort, TAGER has now mounted two cooperative degree curricula which will soon be available over the network to all TAGER members. One program will deal with the classics simply because no institution offers a full curriculum or has a broad enough range of courses to offer a first-rate opportunity in the field to students. Also, the attraction of that offering was not great enough at any one campus to cause an institution to produce a complete faculty, a good library in the field, and so on. The other planned cooperative curriculum is an undergraduate degree sequence in computer science.

Cooperative educational endeavors – particularly when they are put together by both private and public institutions, from both research and undergraduate institutions, from both Baptist and Catholic institutions – are, on the face of it, difficult things to bring off. We have recently begun to change the governing structure of TAGER, and I want to tell you a little about that, because governance of the network may be the most important factor in producing cooperative educational program planning among diverse institutions. There is a lay board of trustees which does not meet very often, and is not, as far as I am concerned, involved in the network as much as it should be. Then there is a rather active group of presidents – the nine chief executives of the institutions on the network – called the Board of Governing Participants.

Last summer, we decided to reorganize a third and important part of the governing structure, the Academic Planning Council. This group consisting of appointees from the faculties of the various TAGER institutions, was responsible for recommending the network's offerings. Despite the proddings of a series of excellent chairmen, the work of this group lacked the verve and broad-gauge concern it should have had. I suspect that a variety of factors – lack of motivation, fear of competition from rival institutions, lack of conviction as to the effectiveness of educational television – contributed to the absence of network-wide

concern which should emanate from such a group.

At any rate, we changed the structure of the Academic Planning Council so that it now consists of the chief academic officers of each of the nine member institutions. In other words, the academic planning group now consists of individuals who sit very close to the president's office, and who have primary responsibility for their institution's academic well being. Sitting with that group are the programming coordinators on each campus. In some cases these latter individuals are communications professionals, in most cases on the software side, and in one or two cases concerned with hardware. This new arrangement, I believe, is going to have a positive effect on what TAGER is able to do for the entire region.

In addition to TAGER, there is in North Central Texas a second body of universities and colleges called the Inter-University Council (IUC). This group is also engaged in cooperative educational activities, and its most recent project has been the establishment of an on-line library cataloging system feeding out of the Ohio College Library Center in Columbus, Ohio. This operation will go on line in North Texas in the next couple of months.

Recently, I.U.C., a 14-institution group, has joined with TAGER in a kind of loose corporate affiliation so that the strengths of the two organizations are now operating together. The Executive Director of TAGER, Mr. Ross Peavey, has also become Executive Director of the Inter-University Council. This is another encouraging development which should enable us to move TAGER forward.

Still another factor points to the strengthening of TAGER. In September of 1972, there was organized among all of the higher education institutions in North Central Texas what was called the North Texas Higher Education Study, chaired jointly by President John Moseley of Austin College and by myself. What the study attempted to do was to look at all of the higher education facilities in the North Central Texas area in order to try to determine where the prospects existed for cooperative activity. This is a difficult kind of analysis to attempt, and the study was not always successful in getting the data it needed. Some things were learned, however, including that fact that the best place to start cooperative effort is in an area where technology is involved. Thus, the IUC on-line cataloguing system is about to be activated.

Thus, also, TAGER has begun to plan a kind of activity that you might call a coordinated videopublishing venture. The North Texas Higher Education Study recommended that TAGER do certain things about its programming. One of the things that it observed – and I was interested that Paul Caravatt made a point of this also – was that the average student on TAGER (although he is a regular college student, and thus fairly sophisticated) comes to the network having seen some very slick production techniques on regular commercial television. The North Texas

Study made the point rather strongly that since TAGER was not now able to produce that same kind of attractive format, the educational network would suffer. We think that there may be ways at least to do some pilot projects of high audio and visual quality, and I will refer to that effort again in a moment.

We think also that TAGER must find a means of marketing its product to its educational audience in a better way and of making itself more attractive to the student. The original philosophy of TAGER, when it was started some seven or eight years ago, was simply that the classroom atmosphere would be reproduced as much as possible over the network. We now believe that that is not adequate, and I think that Paul Caravatt attempted to underline that in his paper.

## IMPROVING THE QUALITY OF PRODUCTION

So quality of production is one of our main problems. What we are interested in attempting to do is to put together a cooperative production unit or center which would help us improve our look and sound. We are, fortunate that there are among our network institutions two fine facilities which may make this a fairly easy thing to do. At the far north end of the network at Austin College, there is a first-rate media production center, a gift of Mr. and Mrs. Cecil Green, the benefactors who created the Green Network. At Dallas Baptist College on the south side of Dallas, there exists another fine center. We are proposing to find the means of using those two centers to establish a kind of videopublishing unit which would create products that would be useful to the entire network.

Our concept of what a videopublisher is, however, is a bit broader than simply that of a unit which produces canned courses. We would anticipate that our center would involve itself in training faculty how to make better use of technology; it would be concerned with providing better visual aids in the live lecture; it might involve itself in totally taped, one-way courses which would be offered once or twice a week, with the network's talkback feature utilized in addition for review sections.

We have decided that the first step in bringing about a cooperative production effort ought to be the creation of a high quality prototype course. This model, which likely would combine live lectures, videotape, and talkback sessions, could show all of the institutions on the network and also potential financial backing (whether it be board of trustees, a foundation, or the legislature) that is is possible to do a superior job of providing an educational product, one that can compete at least to a limited extent with what the student sees over commercial television. While this project lies in the future, it has already been outlined, the proposal has been written, and strong efforts are under way to get the venture started.

If this effort is a success, we have hopes that the next step might be a limited kind of funding for enrichment of current TAGER course offerings. Let me repeat that there continue to be the kinds of problems which are always associated with cooperative educational efforts, particularly when the constituences are varied as ours are. Institutional prerogatives and faculty fears continue to be stumbling blocks; and the problem of paying for the enterprise is made more difficult by the fact that there are both private and public institutions involved, with widely varying credit hour costs.

To summarize, videopublishing, as we see it, involves a richer mix than simply a canned television course. It involves faculty improvement; it involves selling – to administrations, to fund providers, and, most of all, to faculties. It involves the combination of taped sequences, film, live lectures, talkback, and almost all of the arts of television production. Properly understood, adequately funded, and appropriately used, cooperative videopublishing could offer us much.

# CHAPTER 28

# Satellites and Cables

**by Paul Visher**

Today, we are seeing the conflict between two different technologies: The technology of transportation and the technology of communication, the motion of mass and the motion of ideas. We have historically moved people to universities. We have moved their bodies to attend classes. Now, with the advance of communication technology, we have the ability to move ideas around the world. No longer is it necessary to have person-to-person contact to transfer ideas.

The first technology to break the person-to-person pattern was the Gutenberg Press. It enabled people to move ideas by the printed page from place to place, from time to time, permitting many minds to shared the same concepts. Prior to that time, most information was transferred by various religious orders and scribes; a very small percentage of the population was managing and working new ideas.

The technology of electronics has moved this process one step further so that we can now work in real time. Motion pictures are a more powerful tool than the printed page for information transfer, at least when measured by bits of information transferred per unit of time. You can move a great deal more information from one point to another via video than you can via the printed page.

Today we are also seeing a conflict between the technology of information storage and communications. We have heard a great deal about videotapes, videocassettes, and storage of video information. A question results when communication costs for video materials goes to zero; how much information do you have to store at any point? If your communication cost is zero, you can have one storage point and transfer information without additional storage anywhere in the USA. However, you have to develop an understanding of the marketplace for the storage technology in contrast to the market for communication technology. Communication technology has been expanded by such things as satellites.

## THE POTENTIAL OF SATELLITES AND CABLE

We have all seen the impact of satellites—bringing the President to your TV screen from Peking, bringing in the soccer matches and the Olympics from distant points around the world. This would not have been possible five years ago. Until the advent of cable, there was no way to absorb this massive transfer of video information. Today, we are seeing cable with a potential of 30 to 50 channels, and it can go as high as 80 without any fundamental new breakthrough in technology. Cable is able to absorb large amounts of video information via tape storage, satellites, and over-the-air signals. We are seeing the merging of all of these technologies which provide the opportunities for greatly expanded communication. These new technical opportunities provide the basis and the reason for this conference.

To date, no one has been able to put these technologies together into a viable business, particularly in the major market areas where most of the people are. In those areas where people do not have access to over-the-air broadcasting, cable has had a very good return on investments. But, in the top 50 markets, it has been a money loser. The question is how can cable be made into a viable business; how can this allocation of plenty be done when cable systems so far have been economically unsuccessful in the major markets?

People have talked about pay cable and whether there is a market for it. So far, no one has demonstrated that there is a market. A lot of people have spent money. A lot of entrepreneurs have tried to generate a market by trying to feed cable with more mass product, more movies, and more sports which our studies indicate are "non-starters" and doomed to failure. Hughes Aircraft studies indicate that there is not more than 10 to 15 percent of the population in the major markets willing to pay for additional movies and additional sports. The entrepreneur in these markets needs a critical mass of income. A certain minimum amount of money is required for black-box hardware, for cable hardware, and storing of the movies and sports shows. We don't think that a critical mass of income can

be generated exclusively from movies and sports. Yet, the cable people by and large have said at the FCC hearings that they are being deprived of an opportunity to grow because they do not have access to movies and sports. Hughes Aircraft has never testified in those hearings because our market data indicate that no useful purpose would be served by such a fight; there is no significant market for more movies and more sports in the major market centers.

Where is the market for pay or subscription cable? Hughes Aircraft is preparing to invest some $50 million to go into the domestic satellite ownership business. We filed for, and were granted, an authorization to launch a 24-channel system which will really have three purposes. One will be to lease 10 channels to the General Telephone Company which they will use for their own long-haul telephone services. Second, we have offered two free channels to the Corporation for Public Broadcasting. This, then, leaves 12 channels available for exploration of the subscription cable business. (I mean "exploration" because right now it is not a business.) Hughes Industries will have 12 channels for the nationwide distribution system to take a product and distribute it on a nationwide basis. At least initially, we "plan to reach" many areas of specialized interest.

## WHAT ARE THE MARKETS?

We have been doing market research now for several years in different parts of the country and have found that nearly 20% of the population samples would like to receive (and would be willing to pay for) graduate courses in history, English, mathematics and the environment. Moreover, there are a lot of people in the country who would simply like to further their education in history, in English, and in mathematics and psychiatry. We find a smaller percentage, 12 to 15 percent, are interested in geology, art, history, biology, and sociology. Nearly 2/3 of the people in the sample (about 7 to 8 percent) who have not finished their high school degree would like to view high school equivalency instruction programs. If all these groups could be put together, they would amount to almost 50 percent of the population who would be willing to support and pay for various kinds of education services.

The largest single area we found related to activity around the home such as home repairs. We have also found a large body of interest in the hobby areas, the arts and crafts–how to weave, how to sculpt, how to paint, oil painting, water coloring and sketching. Smaller samples, 5 to 7 percent, indicated an interest in the specific area of photography. People who would like to expand their knowledge of photography, skiing and sports, yachting, weaving, and so on are not being served in any meaningful way via the mass video media. What we *think* we are trying to

lo is to test whether or not we can put together people who can produce rogramming in these areas of special interest and market it successfully n subscription cable.

Our technique will be to scramble and to unscramble various kinds of ervices. On a monthly basis, a service can have anywhere from one event o a theatre series with, say, four plays a month or a ballet series with four allets a month. The thing that was most surprising in our market research vas the price insensitivity of the specialized services. If you like ballet, you vill pay $5 a month subscription fee to view five ballets a month. If you lon't like ballet, you are not willing to spend even 20 cents a month for a able subscription. If you like theatre, you are as likely to pay $3 to $4 er month for a cable subscription as 50 cents per month. There is a ignificant economic opportunity for the person who provides services for eople who have already established areas of interest. This is our challenge. Ve have all watched Hollywood dry up because the percentage of the ntertainment dollar they take is an ever-decreasing one. If you go to a nove right now, you have to get a baby sitter for those of you who are ounger, drive downtown, park your car at $2 for a parking lot, take your vife to dinner, spend $3 or $4 for a ticket. The total cost of that evening as been about $20. Current distribution technology being what it is, the roducer gets about $2 of the $20 it has cost us to watch that movie. If atellite and cable television technology works the way that we think it vill work, however, the producer should be able to get up to 60% of the ollars paid for an event. This could mean that Hughes Industries will be ble to feed an awful lot of money back into the theatre groups, artistic roups, and the educational community for various kinds of programming.

In the next several years, there will be many satellite channels vailable for use by entrepreneurs to establish a video distribution usiness. We should all hope that these new technologies will provide a ew level of diversity in video programming in the home. Let's work ogether to achieve that result.

# CHAPTER 29

# Cable Television and the University: Summary Comments

**by William W. Turnbull**

The conference on Cable Teievision and the University brought together college administrators, faculty, and television experts who exchanged ideas and demonstrated their products at six panel sessions, 15 workshops, and a number of television screenings. The conference was, I believe, a rich source of information, ideas, and suggestions. In all, 36 speakers presented their views on a wide range of issues. In this brief, concluding report, I shall summarize their views on major issues and suggest some possible steps.

I have tried to organize the major issues under 7 topic headings, a number I picked hopefully as an omen of luck.

*The Role of Cable TV and Its Promise for Higher Education:* A question that emerged early in the conference concerned was the real promise of the cable. Some true believers seemed to assume it's an educational panacea. Other people questioned whether it really adds much to the older technologies such as the telephone.

The discussions seemed to lead to one possible line of resolution: We probably won't find CATV a particularly useful addition to our educational technology until we have become a little sharper in defining the educational problems we ask it to solve. This observation holds

whether one is discussing use of the cable to transmit sound pictures or to capitalize on its data-handling capacity (which perhaps deserves more attention than it received.) The observation holds whether one is discussing use of the cable to transmit sound and pictures or to capitalize on its data-handling capacity (which perhaps deserves more attention than it received.) The observation was generally accepted and is perhaps beyond debate. But there is a problem. The conference demonstrated that there is a considerable gap between the understandings of administrators and those of technology, or media, experts. This gap created some problems, yet in important ways it defined the meeting's significance.

Hostetter[1] has called cable "a technology in search of a market." But the search may also go the other way. The market may need the technology. However, educators are not yet familiar enough with the specific possibilities to formulate the questions they would like to ask. We usually can't articulate an educational problem or goal very well without some sophistication about what options are available to us.) The prevailing view seemed to be that once the options are known and the problems formulated, cable will be found to have an important place in a mixed-media approach to their solution. Granting that the basis for this view is more intuitive than empirical, it is buttressed by the accounts we heard and the demonstrations we saw of several impressive activities already well begun around the country.

*The Institution's Problems in Deciding How to Play the Cable Game:* This set of problems runs the gamut of institutions represented at the conference. It presents itself most acutely to those with least experience. Even for the best-informed, CATV is a fast-moving field in which it's hard to keep track of developments from technology through regulatory practice to courseware. The questions, at a more basic level, sounded like this: "What does a CATV system look like and how does it operate? Please describe one. What are we talking about?"

"Who takes the initiative? "No cable companies have visited my university. Am I supposed to seek them out? Or will they come to me, or to the community?"

There was a nearly universal cry for more practical help as a follow-up to the conference, which whetted many appetites through the illuminating discussions in the panels and workshops. People would like to see such things as

- a handbook on franchising
- a casebook illustrating various structures for managing institutional resources: financial, technological, human, physical
- a practical guide to the problems of copyright and of exchange of video materials, including the roles and functions of libraries, media centers, and so on.
- information as to reliable sources of consultative help

In fact, some of these things already exist. But many people don't

know about them. They want to know how and where to get the word.

*The Faculty: Its Care and Especially Its Feeding:* The conferees took note of the problems of introducing cable, which can be done only with the active cooperation of faculty whose enthusiasm, as President Lyman put it, is muted. There are serious issues here of the staffing requirements for a system, of motivating and training faculty, of incentives such as extra time or extra money, including sharing of copyright. (Someone noted that this is a non-issue since there is no money to be made anyway.)

How do you identify people who can be effective and are willing to work hard? There were no pat answers proposed. Again, this was identified as an area in which models or casebook descriptions could help.

There seemed to be a belief that the resistance, apathy, or fear of faculty (and someone even dared to suggest, of administrators) are real but perhaps not inevitable. The problem is basically one of leadership in the management of educational change, which is hard to capture in a handbook, but which could be facilitiated by practical suggestions on rewards, incentives, and protection of legitimate rights.

*CATV Outside the Classroom and the Mysteries of Quality:* The idea that CATV can be used *in* the classroom to reasonable advantage was not much argued. It seemed a reasonable and familiar proposition. The debates tended to center on its out-of-classroom use. Here again, the issues don't revolve around cable television *per se*: it's just a technique that makes us ask what clientele the university is trying to reach and how is that clientele diversified. How big are the significant subgroups? Do they want us?"

The converse question (Do we want them?) was also raised in the question "Are we in danger of educating too many people at the college level?" Mostly, however, people at the conference were looking for ways to broaden the audience, and the question was how. How can you effectively engage the attention of people who otherwise would not have access to what the university has to offer? Many thought it more promising to concentrate on the concerts, the drama offerings, the art available through the university in a program of cultural enrichment. The community colleges spoke more of community involvement and of using the medium to help the community gain access to its own resources as well as those of the college. Those who looked for cultural enrichment in some cases argued for a degree of technical quality in the production. Others favored quick-and-dirty approaches, moving quickly to cover community events, drawing heavily on the help of students in media courses as part of their instruction. These issues probably have to be decided by each institution in the light of what it is trying to do, the basic educational question.

The discussion of off-campus or out-of-classroom learning, whatever philosophy it was based on, quickly led to the issue of attesting to whatever learning has taken place. In a society as credential-oriented as ours, some people obviously will want credit for their accomplishments in

a non-traditional setting, whether cable is involved or not. The issue of standards for credit is a very serious one for faculty, administration, and ultimately students, especially as they try to transfer credits. It will have to be solved regardless of the impact of CATV, but the new medium highlights the need, as it moves the burden of proof of learning away from testimony as to courses attended and toward demonstrated competency. The new institutions like Empire State face this matter as a central problem, of course, but it was plain that the concern runs through every kind of college or university represented.

*Can we help one another and do we want to?* Institutions now are proceeding somewhat by trial and error either to produce or to find material to put on the cable. The quality is uneven, there is much redundancy of effort, and there is little sharing of resources.

What about a catalog of available material or a national clearinghouse or consortia to produce or exchange material? Generally, such ideas received endorsement in principle but encountered some practical objections. One person, who was probably not alone, said, "If there's a catalog, I'd like to have my stuff in it, but I doubt that I'd use anybody else's."

Are we to have two classes of colleges – the producers and the consumers? Many people would like to be the former. Would such a system drive institutions into two camps? Or will most institutions, in fact, have to be consumers, whether or not they are producers, if they are to achieve diversity and quality in their offerings?

One conference member suggested that learning how to solve the sharing problem is perhaps the hardest and most urgent task before us. If we share, we need standards, evaluations of quality of material and of level of student performance. How can we provide these?

A suggestion was made that at least we might agree on standardized technical formats so that there would not be mechanical problems in exchanging material. In the areas of content and of quality, however, institutional autonomy is treasured. The idea of pooling with a small consortium raises anxieties, and these are elevated by some orders of magnitude by proposals for national mechanisms that might lead to standardization or homogenization. No matter what the obstacles to cooperative action, however, the consensus appeared to be that we simply have to find ways of circumventing, neutralizing, or overcoming them.

Those at the conference could readily agree that education does not seem to speak with a clear voice on issues of major policy. We have to develop a sure sense of what needs to be done with CATV and other technology if we are to ensure the continued attention of legislative or regulatory bodies to the present and future needs of education. With the vast increase in the complexity of the technology as satellite, microwave signals, and networks become common, and in view of the huge

investments entailed, the stakes will be high indeed. Our moves on the national scene should proceed according to the best forecasts of our future requirements and the part that CATV in its present, and most particularly its future, forms could and should play along with other technologies.

We may have associations or agencies that are appropriate to the new tasks of sharing effort and resolving dilemmas among institutions or we may have to create new ones.

*The Question of Money:* Many of the suggestions that were brought forward automatically posed the question: Who's going to pay for it? Let me hasten to add that nobody answered that question.

There was some agreement that we will be shortsighted if we look solely at the costs of doing the present educational job better or cheaper for the same people by cable. We should recognize that the cost problems arise in part from our attempts to broaden radically the scope of our work and to reach substantially "new" groups of learners. This implies new techniques of analyzing and describing markets for cable learning, and these markets need not be remotely competitive in size with commercial broadcast markets to make CATV enormously useful.

The question of money adds tension to the relations among the community, the cable operator, and the university. We see an uneasy balance in which it isn't quite clear who are partners and who are in adversarial roles. Who is to supply equipment? Who supplies the expertise? These questions have very large dollar consequences.

For many universities, the financial problem is apparently not one of production facilities. The extent and quality of these surprised a number of participants. Other universities are not well equipped, which again suggests possibilities of sharing in an era of tight budgets.

The successful development of cable may depend on intelligent setting of social and educational priorities, and pooling of scarce resources among government officials, educators and operators. This is made difficult by conflict between education's search for long-range solutions and the search by government and some operators for short-range payoffs.

## SOME POSSIBLE STEPS: FOUR DEBATABLE PROPOSITIONS

*Policy formulation for education use of cable:* Should we argee upon an *educational* forum – existing or to be created – to concern itself with developments in cable communication? Should such a forum recommend policy at federal, state, and local levels and also to institutions and technology companies in order to maximize educational potential of the medium?

*Provision for institutional support services:* Do we need a continuing mechanism under appropriate institutional auspices to give colleges and universities consulting and other assistance in such matters as technology,

market studies, goal setting, franchising, courseware development, data transmission applications, accreditation for learning, faculty involvement?

*Inter-institutional cooperative arrangements:* Do we need a continuing center or centers for research and development and dissemination? Such a cooperative organization might well explore and disseminate models, stimulate the development of high quality materials, catalog and distribute material, arrange periodic conferences, produce a newsletter and undertake other clearinghouse functions, make studies of potential uses of cable in traditional and nontraditional settings, study financing patterns and cost effectiveness.

*Conference follow-up:* Should we organize a small task force to propose concrete steps? If so, should they include further conferences of a larger group not unlike this one?

## THE CONFERENCE

I believe the Conference has served a useful purpose in broadening the understanding of all of us who have attended. Its usefulness may be multiplied many times over if it leads to practical programs of action to deal with some of the critical problems we have identified in these three days.

# CHAPTER 30

# The World of the University and Two Worlds of Television

**by Lloyd Morrisett**

This conference has given us an extremely broad and realistic view of cable television and areas related to it such as interactive television. Certain points have emerged that strike me very forcefully. I have tried to organize my thinking by putting myself in the position of a college or university administrator and asking "Should I involve my institution with cable television? What conditions would I like to see satisfied before giving a firm 'yes' to that question?" Five or six conditions seem clear to me at this point. Perhaps there are others.

First, I would ask "Is my institution located in a good cable town?" Some are and some aren't, and at this conference we have heard about some extreme differences. Simon Fraser University in Vancouver with 100,000 cable subscribers, the University of California in San Diego with 40,000-60,000 subscribers, and the University of Vincennes in Vincennes are all in good cable towns. Many institutions are not. While some places that are not now good cable markets may become so, I would want to have the market proven before I got into it.

A second question I would ask would be, "Does my institution already have an emphasis on television-related skills, including the education of professionals who go into television?" In other words, is there a pre-existing faculty commitment that allows people to look upon involvement in cable television as a natural outgrowth of ongoing university activity? Some schools are fortunate in this regard and have this preexisting commitment. Two examples are UCLA with a strong program in preparing television professionals and San Francisco State with a strong program in theatre arts and allied skills. You will easily add to this list your own examples. Not every school has this commitment, and to try to turn a school in this direction if you lack the faculty and course structure may prove extremely difficult.

The third question I would ask is, "Does my institution have strong programs in entertainment and sports? Do we have a theatre arts program that is strong and well patronized? Do we have a good football, basketball, girls' basketball, volleyball, or whatever-it-may-be program that might have some interest for the general audience over cable television?" Some schools, the University of Wisconsin or the University of Iowa, for example, I would regard as very strong in this regard, other schools not. It depends on your particular circumstances. This doesn't mean only large schools qualify. There are small schools which have very strong programs in their own communities and can offer attractive events for cable television.

A fourth point, "Does my school have a financial and philosophical commitment to reaching beyond its normal student body?" On this dimension, there are extraordinary and legitimiate differences. If you travel around the country to a place like the University of Kansas or the University of Alabama, for example, you find that the tradition of the institution is clearly toward statewide service, reaching out beyond the people on the campus. The Medical School at the University of Alabama believes it should serve all the doctors in the state, and so does Kansas. Some institutions do not believe this is their role and would have a difficult time convicing their faculty, their trustees, their students, or their constituents that it should be.

A fifth point, "Is my institution already committed to non-traditional forms of study?" Some institutions regard themselves as primarily places to which people come to undergo a learning and growth experience where residence on the campus is of primary importance. Other institutions clearly try to reach out in myriad ways to educate students wherever they may be.

The final point I would be interested in is, "Does my institution have the administrative flexibility that will allow us to make the necessary compromises, do the necessary negotiating, and finally, make the arrangements to get into cable television in a useful and productive way?"

## MAKING ARRANGEMENTS FOR CABLE TV

When I ennumerated these six criteria, I could not think of many institutions that met all of them. Many institutions will be fortunate to meet one, or two, or three. The failure to meet one or more of these criteria is not decisive, but it would be cause for some careful thinking about the likely success of a university commitment to cable television. Let's say, however, you've made the commitment and have decided to go into cable television, what arrangements might you make? First – and it's been the arrangement most often discussed here – you might simply use the cable television system as a convenient and free distribution system for your product. It's widely recognized that many existing cable systems have much free channel time, particularly the newer ones that may have 20 or more channels available. The cable operator may be glad to give you time. If your product attracts only one additional subscriber, it will be profitable for the cable operator assuming that he incurs no additional costs. So, for the present at least, as long as there is unused channel capacity, universities and colleges in some locations have a chance to obtain free time and make use of it for the distribution of their product.

You could also try to sell your services to the cable operator or to his customers or, perhaps, to buy services from him. When I say "sell and buy," of course, this suggests a different framework for the consideration of cable television than if you're getting free service. If you try to sell something to a cable TV operator, you may find a more steely glint in his eye than if you are simply asking for free time. Cable TV operators have not found that the distribution of the product ordinarily provided by colleges and universities is very attractive to their customers. When it's free and it doesn't cost them anything, that's fine. One new subscriber makes it worthwhile. When it's not free, the cable operator has to take some very different considerations into account, and your product will be looked at in hardnosed economic terms.

A third kind of arrangement, and one which we have seldom seen, is university ownership of some or all of a cable system. If you become the owner of a cable system, you will become aware of the economics of cable operations and be concerned with the same things that the commercial cable operator has to be concerned with. You will at least be concerned with staying out of the red, and perhaps with making a little profit so that you can support other things. It is an orientation that is very different from the normal college orientation toward education. I'm reminded here about many universities' experience with computer centers. A computer center is a good thing to have until the costs of maintenance and personnel mean a financial loss that cannot be justified simply on the basis of the ready availability of research and teaching time. Of course, this did not

happen to everyone. Institutions that did get into trouble with their computer centers had to revise their philosophy of management against the reality of income.

## THREE WORLDS

If your university becomes involved with commercial cable television, I think you will likely become aware of three separate but interesting worlds worlds. One of these worlds we have talked about a great deal, one a little bit, and one not at all. The university is the first of these worlds. In his paper, Dick Lyman, outlined the realities of the university world very clearly. Many of us are familiar with those realities and his observations struck a responsive chord in us.

Another way to look at the university world is to try and analyze the motivation-reward system for the university student. I do this because I want to compare it with the motivation-reward system for the television audience. A university student typically pays a high price in advance for a product that is not, or cannot be, fully described. It is partially described in the college catalog, and he's asked to put down an initial payment. Further, he is going to continue to pay over a period of several years. If the student pays the price for four years, he is told he will be satisfied. In addition to paying the high price, he voluntarily assumes an obligation to work to make the product good for him. He's not simply given a product, he's told that he has to help create it. Moreover, the rewards – a degree, perhaps a job – will be delayed. In fact, he may not appreciate the rewards from what he's paying for until he's out of college for 10 years or more. In addition to putting the rewards off for a long time, he voluntarily allows you to apply sanctions so that if he does not live up to your expectations, he can be fined – given poor grades, or suspended. The student must meet the institutional standards after he's paid the price to get in, and if he doesn't something's wrong – with *him*. Finally, the system makes it very difficult for the student to change his mind if he thinks he's made a mistake. Transfer of credits has become easier but it's still difficult. In many institutions, to drop a course at mid-term and start a new one is impossible without the loss of grade credit or, perhaps, receiving an F.

All these things operate on students and tend to produce captive audiences. If a student is enrolled in a class, he has assumed an obligation to be present. If he does not like your brand of teaching, he will have a hard time getting away. True, he can go to sleep, but even then there are some sanctions to be applied if he does it too often.

Television, that second major world, is very different. Television asks the individual to pay a very low cost for his entertainment, to pay indirectly, and only after seeing it. A television program doesn't ask him to put up the money in advance; it asks him to watch the advertisement and

go out and buy the product after he's seen the program. There is n assumed obligation to participate. If an individual watches the program, h can participate in it, interact with it as much as he wants, and if he feel like sleeping, fine. There are no sanctions if he decides to turn it of Switching channels can be done easily and with minimal liability. He ma lose a little of the drama if he is late in switching into an adventure serie but that's about all. There are no strong liabilities involved; the televisio audience is not a captive one. Television producers do not keep thei audience if they do not continue to interest them.

These contrasting motivation-reward systems impose very differen disciplines on the college professor and the television producer. Th professor, as a result of the system he's working in, is primarily concerne with course coverage, with the emphasis on content and intellectua mastery. Understatement and esoterica are prized. Oh, to be back in th faculty dining room at Berkeley telling my colleagues, "Next semester, I'm giving a little course on non-linear algebraic and geometric technique applied to the biophysics of animal learning." Or, "I'm giving a seminar o semantics and computer technology as applied to the identity of the Dar Lady of the Sonnets." Obviously, the requirements for these courses ar high; I may not have more than one or two students, but if one studen out of that 25,000 is able to take that course and understand what I'm trying to get across, I'm a success.

The professor hopes to communicate his own view, his own somewha idiosyncratic and highly developed view, to those few people who ca understand it. Sometimes the discovery of one best student gives him th most satisfaction. Compare this with what you might hear at CBS when producer says, "Boys, I've got *The Mod Squad* next year." Or, "How d you like *Psycho* as a title?" It's not understatement; it's not esoteric. Th prizes in television are for getting something together that wi immediately come across, be understood, and attract large numbers o people.

When these two worlds meet, there is likely to be conflict. In th production of *Sesame Street*, we tried bringing together those interested i intellectual mastery with those interested in entertainment. At th beginning of *Sesame Street*, we heard from the professors: "This is a ver dubious project because the people in commercial television probabl can't understand the reasons for doing these things, won't follow ou advice, and our styles and techniques of working are so different that w probably can't work with them at all." From people in television w heard, "We can't work with people in colleges and universities becaus they are not interested in an audience; they don't know what creativit means; they're only concerned with the pedantic, pedagogical approach t things, and we cannot work with them." With *Sesame Street*, it took abou a year before those two polarized views could be brought into enough of

marriage so that a program could be produced. Given a sizeable commitment of money, time, and effort, it proved possible to bring the world of academe and entertainment together.

In one way or another, something like this will happen if universities become fully engaged with cable television. Those television types and that world are out there. They're waiting and they have something that they think they can teach you, but they don't know that you'll want it or will listen. In the same way, you have something to teach them.

The producer of a television show must attract audiences; he's concerned with advertising. His emphasis is on emotional involvement – form, personality, and drama – are more important than intellectual mastery. The television viewer wants to be attracted to a program. If you can give him information and also keep him interested and entertained, he's likely to be happy about. However, the television viewer must be entertained first or he won't watch the program – unless, of course, he is part of a captive audience. If he has paid a fee to take your course on television, then the differences between the TV set and the classroom tend to disappear.

Cable television is the third of these interesting worlds, and its dynamics are different from those of either television broadcasting or the university. The dynamics of cable television are based on the amount the subscriber is willing to pay per month for service and the percentage of potential subscribers in the area that the cable operator can sign up. Profits and ability to stay in business are fundamentally based on two points – the subscriber rate and the rate of penetration. If you can give a potential subscriber increased choice – that is, put more things out over more channels – the probability of adding subscribers goes up. If you can make those choices highly attractive, the subscriber may be willing to pay more for what he receives. But the cable television world is not the world of television and it is not the world of the university, it is a service industry where the problems are the maintenance of equipment, billing, selling new subscribers, and keeping yourself afloat. When we talk about the university involving itself with commercial cable television in a serious way, it seems to me that the cultural differences among the worlds of the university, television broadcasting, and cable present real obstacles to success. It is because of these obstacles that I listed six criteria to meet in order to have the best chance of success in putting those three worlds together.

## THE FUTURE COURSE FOR CABLE AND THE UNIVERSITY

The future course for cable television and universities may depend heavily on two factor that we have not considered in detail at this conference – the networking of cable systems, by satellite or other means, and pay cable. The networking of cable systems will allow the aggregation

of audiences over wide geographical areas. Services, such as university courses, that appeal to a small percentage of people may attract relatively large numbers when the potential market becomes large enough. The provision of pay cable, in which services are paid for as used, will make possible a direct relation between the viewer as consumer and the university as producer. Under these conditions, I would expect that a number of producers will attempt to sell similar products. At that time, the ability to bring together sound intellectual content with the techniques of entertainment will not be simply a matter of preference; it may be an economic necessity in order to compete in the new educational market. Personally, I find this idea of broad educational markets for universities exciting, and I am hopeful that economic necessity may achieve what seems difficult how – the bringing together of the three worlds of the university, commercial television, and cable television.

# Appendix A

## Possible Uses of CATV at the University of Illinois, Urbana-Champaign in the Period 1973 – 1980*

by Donald P. Mullally

It is difficult to determine how much use there might be (if any) of a CATV system at the University of Illinois due to a host of policy and budgetary considerations which are not relevant to this paper. Therefore, the reader should interpret the term "will" as used herein to be an estimate of what might be seriously considered, rather than a statement of the probably or the certain. The purpose of this document, therefore, is to enable basic planning to proceed so that the proper options will be considered in the initial construction of any CATV system. It is also anticipated that this paper may form a basis for certain internal administrative decisions which are yet to be made. Since the availability of a number of options will certainly affect the decision-making process in the future, it is important to preserve these options as a system is designed and constructed.

It is almost impossible to imagine the time frame of some of the developments discussed herein. The reader must be especially aware of the fact that although some of the developments hypothesized in this paper

*This summary was prepared prior to the establishment of the franchise in Urbana and Champaign.

will almost certainly materialize, the order and timing of these developments is subject to a good deal of variance, depending upon such factors as availability of funds, success or failure of certain research, state-of-the-art with respect to CATV engineering, and a host of unknowns.

## CCTV DISTRIBUTION

One of the earliest uses of a CATV system will be the distribution of program material from the closed circuit center located at WILL-TV. This instructional television system now distributes programs to classrooms in certain buildings. With the addition of dormitories to the system, it seems likely that somewhat more use might be made of closed circuit television. It appears that one of the best potential uses for television is information transfer in the learning situation. Reduction in the number of classroom lectures and the use of TV as the information transfer medium would make available a certain amount of additional faculty time for the discussion of the implications of and relationships between facts transmitted via television. Because videotape would allow repetitive scheduling of TV "lectures" it would be possible to give students a number of exposures to the class material, at times convenient to the student.

Since many students do not live on the campus, it is likely that most early experiments with televised instruction will also make use of one or more channels on the city system to reach off-campus students.

There is some reason to believe that a Federal grant might be obtainable to fund initial research into the repeated-exposure/convenience-scheduling technique.

Somewhat later (perhaps two to three years after the system becomes available) it may be possible to embark on a responsive learning program via CCTV/CATV. This would require that students in the response groups be provided with a device to enable them to communicate either with a computer, or with the professor directly. The former situation would allow the student to be tested by means of questions appearing either on the TV screen or in printed form; his responses would be tabulated by a computer. The latter situation would allow a professor to have a certain amount of immediate feedback concerning how well his students are understanding his presentation, even though he is engaged essentially in a lecture situation. Presumably these response devices could be loaned to students in particular classes, thus keeping the investment in such hardware at a relatively low level. Again, it is possible that some Federal or foundation funding might be available either for the purchase of hardware, or for experimentation.

## THE PLATO IV SYSTEM

It seems likely that very early in the development of a CATV system,

PLATO (the interactive CAI system at the University) will make use of it. While the present number of terminals is only in the hundreds, it is anticipated that within ten years there may be as many as 5,000 terminals in Champaign-Urbana and elsewhere. These terminals will be located on the campus in several buildings, and in the community (probably in schools and at Parkland College). These terminals demand two-way capability, although approximately 1,000 terminals can make use of a single video channel in each direction. This system has proven quite successful, and has generated considerable support from the U.S. Government. It seems quite possible that terminals will be placed at the Chanute Air Force Base in Rantoul, Illinois. Interconnection with any CATV system in Rantoul may therefore be quite desirable.

## COMPUTER DATA TRANSMISSION-DIGITAL COMPUTER LABORATORY

There are now a number of remote terminals connected to the IBM 360/70 computer at the Digital Computer Laboratory. These terminals range from complete remote processing facilities to small PLORTS teletypewriter terminals for individual use. It seems reasonable that these terminals will ultimately make use of some of the spectrum space afforded by the CATV cable.

## DATA TRANSMISSION-ADMINISTRATIVE DATA PROCESSING

The University may find it desirable to initiate an inventory control system with a terminal at the Central Receiving Warehouse connected to the ADP computer in the Administration Building.

Other inventory and billing systems might well be tied into this computer via remote terminals: Chemistry Stores, Photographic Stores, etc.

## PROGRAM PICKUP: BROADCAST SERVICES

Depending upon the quality of the system, the cable may be used to relay remote broadcasts from virtually any point on the campus to WILL-TV and WILL-AM/FM studios for recording or live broadcast.

## TEACHING FUNCTIONS: DEPARTMENT OF RADIO-TV

Upon completion of the studio facilities (which, it is hoped, will be quite well-equipped) some of the teaching functions of the RTV Department could be moved from WILL-TV to the new studios. These might include basic TV production classes, TV News classes, and others.

Courses in radio news and radio production would presumably also move to the new radio studios provided.

With the use of equipment provided by the franchisee, students in the RTV and other departments might well produce a daily news program for the communities and the campus. Students might also choose to produce other program series as laboratory exercises or as "workshop" experiences. It seems likely that these programs would be available for cable distribution in the local market. Moreover, students would probably take a very active role in programming and community radio station, which should become the audio portion of one of the automated video services.

## FOREIGN LANGUAGES AND POLITICAL SCIENCE

Very early in the development of the system, the franchisee will provide several short-wave radio receivers of high quality. The foreign language departments may provide a graduate assistant to tune and record news and other programs in several foreign languages on a daily basis. Also, the English language services of Radio Moscow, Radio Peking, BBC, Voice of America, OIRT (France), and other countries might be provided. This could also be rebroadcast on the Community Radio channel mentioned in the paragraph above.

## EXTENSION SERVICE

Depending upon community interest and the availability of funds, the University Extension Service might well provide educational programs or classes via CATV for those members of the community who do not attend the University on a regular basis. These classes could be credit or non-credit courses. When and if this CATV system is interconnected with other systems in the state, such classes could be made available to people everywhere in Illinois.

One specific type of program might be provided by the Agricultural Extension Service. Sessions on gardening and the raising of flowers and edible produce might find wide interest in the community (and in the state, with the coming of interconnection facilities).

## PHYSICAL PLANT SERVICES

It seems likely that at some time in the rather near future the Physical Plant department will obtain equipment for the monitoring of building services: heat, air conditioning, ventilation, electric power, steam pressure, etc. This equipment might be connected to a central monitoring point by means of the cable.

## BUILDING AND EQUIPMENT SECURITY

By means of automatic instrusion alarms and heat/smoke sensors, the University police and fire departments could be alterted to any difficulty in campus buildings. These sensors would presumably use CATV cable to relay data to the appropriate authorities.

Another use of the system, related to security functions, is the possibility of an emergency notification scheme. Upon the development of an emergency on the campus (such as the approach of a tornado, serious bomb threat, etc.) or if it is desired to communicate to the campus community an announcement of significance, a scrambler device would generate hash on all TV channels. This would be periodically interrupted with both audio and video instructions regarding the impending emergency—interrupting programming on all channels at all TV and radio sets connected to the cable.

Similarly, a coded signal could be sent to the *homes* of all University policemen and firemen (or city police and fire department members) requiring them to report for duty at once. This would not depend upon the home television set being in use at the moment.

## MEDICAL USES

The University medical school may well desire interconnection for either audio/video or data exchange with local or more distant hospitals and clinics. This might be in addition to whatever uses the medical school would make of the PLATO system.

## LAW SCHOOL

Quite early in system development it may be desirable to link a room at the University Law School to the County Courthouse in Urbana. Remote pan, tilt, and zoom controls would allow the use of an inconspicuous camera at the rear of the courtroom so that law students could watch trials in progress. These signals would be delivered to the law school only.

## LIBRARY

Library uses seem especially difficult to predict.

Reduction of the library catalogue to computer storage would allow access to the catalogue at remote points through the use of touch-tone telephone or the response devices mentioned earlier. Catalogue items could be displayed on the home TV screen through the use of a character generator. Whether responses would be unaddressed or individually

addressed would depend upon the switchability of the system.

Computerization of check-out/check-in and circulation data would allow each of the several departmental libraries to have terminal devices, linked via the cable, so that all record-keeping could be done at a central point.

## GENERAL STUDENT SERVICES

There are a number of services to the student community which could be delivered via CATV. For example, schedules of campus events, film and concert program information, instructions for registration, entertainment programs at local commercial establishments, Union menus, dormitory menus, and the like could be flashed on a TV screen repeatedly by means of a relatively inexpensive message wheel or character generator. Events of interest to students could inexpensively advertised or promoted in this same way.

It is also easy to imagine the use of CATV as a cultural enrichment medium. Programs (either audio alone or audio-video) could be run repetitively to give students additional exposure to the kinds of experiences seldom available on regular radio or TV. These programs might be informal and student-originated (as in the case of student musical groups) or more formally staged events (such as graduate musical recitals, theatre workshop programs, lectures by visiting scholars, or informal conversations with some of the great minds in the campus community. Indeed, one can imagine students appreciating the opportunity of getting exposure to samples of disciplines other than their own. It is conceivable that some of these programs might be shared with the off-campus community, or with students on other campuses as interconnection becomes available.

This discussion of the uses of CATV is intended to merely suggest the range of possibilities. If members of the campus community or potential franchisees have other suggestions, I would be delighted to hear from them. Please address any response to:

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